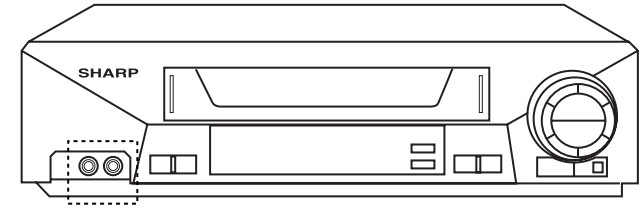
SHARP SERVICE MANUAL

S70E1VC-TA350

VHS VIDEO CASSETTE RECORDER



VC-TA352W Only

VC-TA350
VC-TA351
VC-TA351W
VC-TA352W
VC-TA355
MODELS VC-TA356

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified be used.

CONTENTS

SHARP CORPORATION

PRECAUTIONS IN PART REPLACEMENT

When servicing the unit with power on, be careful to the section marked white all over.
This is the primary power circuit which is live.

When checking the soldering side in the tape travel mode, make sure first that the tape has been loaded and then turn over the PWB with due care to the primary power circuit.
Make readjustment, if needed after replacement of part, with the mechanism and its PWB in position in the main frame.

(1) Start and end sensors: Q701 and Q702

Insert the sensor's projection deep into the upper hole of the holder. Referring to the PWB, fix the sensors tight enough.

(2) Photocoupler: IC902

Refer to the symbol on the PWB and the anode marking of the part.

(3) Cam switches A and B: D708 and D709.

Adjust the notch of the part to the white marker of the symbol on the PWB. Do not allow any looseness.

(4) Take-up and supply sensors: D707 and D706.

Be careful not to confuse the setting direction of the parts in reference to the symbols on the PWB. Do not allow any looseness.

1. SPECIFICATIONS

Format:	VHS PAL/MESECAM/NTSC standard
Video recording system:	Rotary, slant azimuth two heads helical scan system
Video signal:	PAL/MESECAM/NTSC colour or monochrome (System B/G, I, D/K) signals
Recording/playing time:	240 min max. with SHARP E-240 tape (PAL: SP mode) 480 min max. with SHARP E-240 tape (PAL: LP mode) (Only for VC-TA351/TA351W, TA352W, TA355, TA356) 160 min max. with SHARP T-160 tape (NTSC: SP mode) 480 min max. with SHARP T-160 tape (NTSC: EP mode) (Only for VC-TA351/TA351W, TA352W, TA355, TA356)
Tape width:	12.7mm
Tape speed:	23.39 mm/s (PAL: SP mode) 11.70 mm/s (PAL: LP mode) 33.35 mm/s (NTSC: SP mode) 16.67 mm/s (NTSC: LP mode) (Playback only) 11.12 mm/s (NTSC: EP mode)
Antenna:	75 ohm unbalanced
Receiving channel:	VHF Channel 1A - S41, UHF Channel E21 - C57
RF converter output signal:	UHF Channel E21 - E69 Adjustable preset to E60 (For A/M/B/W-version) UHF Channel E21 - E69 Adjustable preset to E39 (For S/K/L-version)
Power requirement:	AC110 - 240V, 50/60Hz
Power consumption:	Approx. 13W at 240V/50Hz
Operating temperature:	5°C to 40°C
Storage temperature:	–20°C to 55°C
Weight:	Approx. 2.8 kg
Dimensions:	360 mm (W) x 256 mm (D) x 92 mm (H)
VIDEO	
Input:	1.0 Vp-p, 75 ohm
Output:	1.0 Vp-p, 75 ohm
S/N ratio:	45 dB (PAL-SP)
Horizontal resolution:	250 lines (PAL-SP)
AUDIO	0 dBs = 0.775 Vrms
Input:	Line 1: -8 dBs/47k ohm
Output:	Line -8 dBs/1k ohm
S/N ratio:	46 dB (SP mode)
Frequency responce:	80 Hz ~ 10 kHz (SP mode) 80Hz ~ 5 kHz (LP/EP mode)
Accessories included:	75 ohm coaxial cable Operation manual Remote control unit Battery

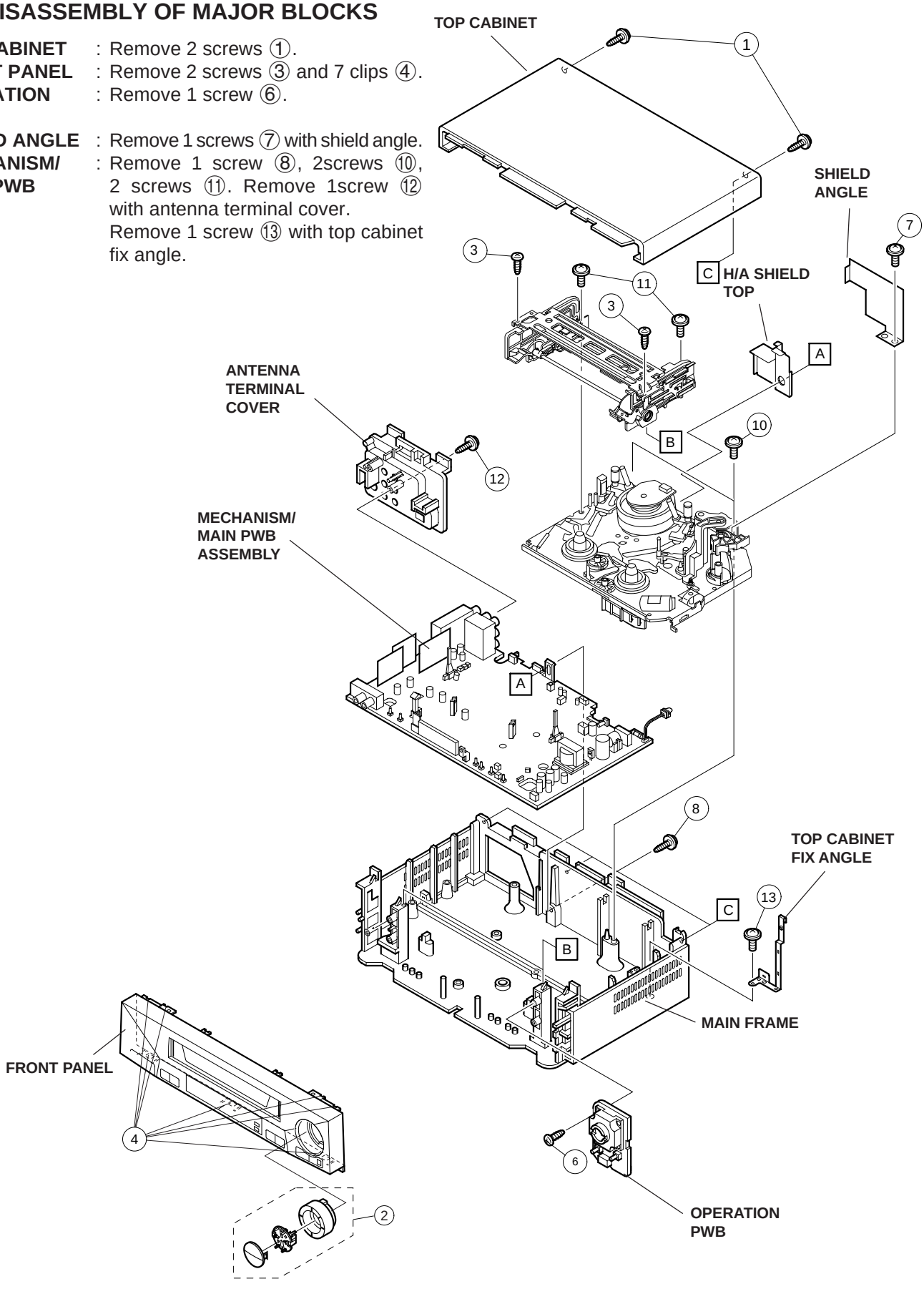
As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice.

Note: The antenna must correspond to the new standard DIN 45325 (IEC 169 - 2) for combined UHF/VHF antenna with 75 ohm connector.

2. DISASSEMBLY AND REASSEMBLY

2-1 DISASSEMBLY OF MAJOR BLOCKS

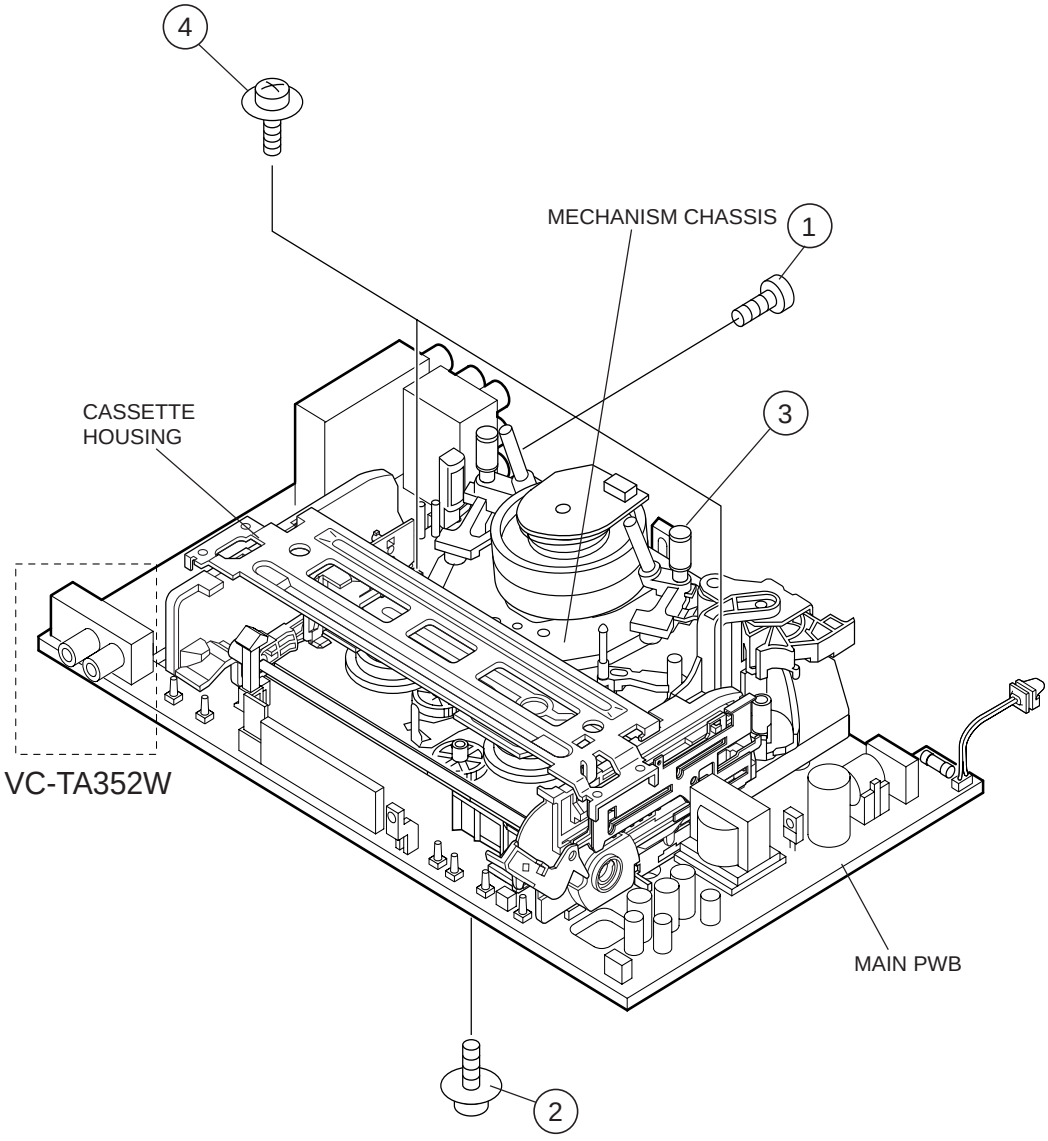
TOP CABINET : Remove 2 screws ①.
FRONT PANEL : Remove 2 screws ③ and 7 clips ④.
OPERATION PWB : Remove 1 screw ⑥.
SHIELD ANGLE : Remove 1 screws ⑦ with shield angle.
MECHANISM/ MAIN PWB : Remove 1 screw ⑧, 2screws ⑩, 2 screws ⑪. Remove 1screw ⑫ with antenna terminal cover.
Remove 1 screw ⑬ with top cabinet fix angle.



2-2 DISASSEMBLING THE MECHANISM/MAIN PWB ASSEMBLY

1. When removing the mechanism from the main PWB, remove the antenna cover 1 screw ①, and remove the antenna cover.
   Remove the PWB bottom plate 1 screw ②.
   Remove the FFC cable (AA, AD, AH) ③ which connecting the PWB and the mechanism.
   Take out vertically the mechanism so that it does not damage the adjacent parts.

2. Removing the mechanism and cassette housing.
   Remove 2 screws ④ fixing the cassette housing to the mechanism, and remove the cassette housing.



2-3 CARES WHEN REASSEMBLING

INSTALLING THE CASSETTE HOUSING

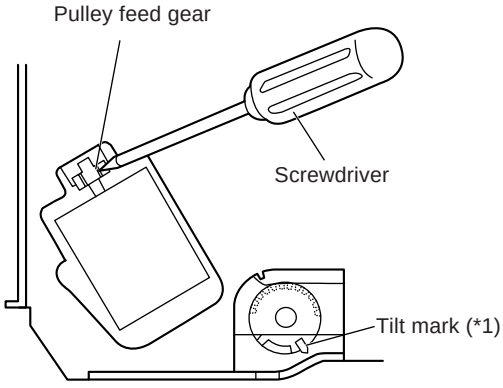
When the cassette housing is installed on the mechanism, the initial setting is essential condition.
There are two initial setting methods, namely electrical and mechanical.

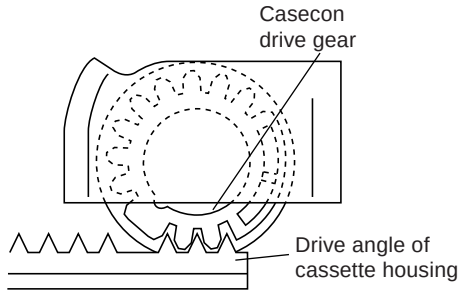
1. Electrical initial setting

So as to perform initial setting of mechanism execute the Step 1 of Installation of cassette housing. After ascertaining the return to the initial setting position (*1) install the cassette housing. (Conditions: When mechanism and PWB have been installed)

2. Mechanical initial setting

Feed the pulley feed gear of loading motor with screw driver. After ascertaining the return to the initial set position (*1) install the cassette housing in the specified position. (This method is applied only for the mechanism.)



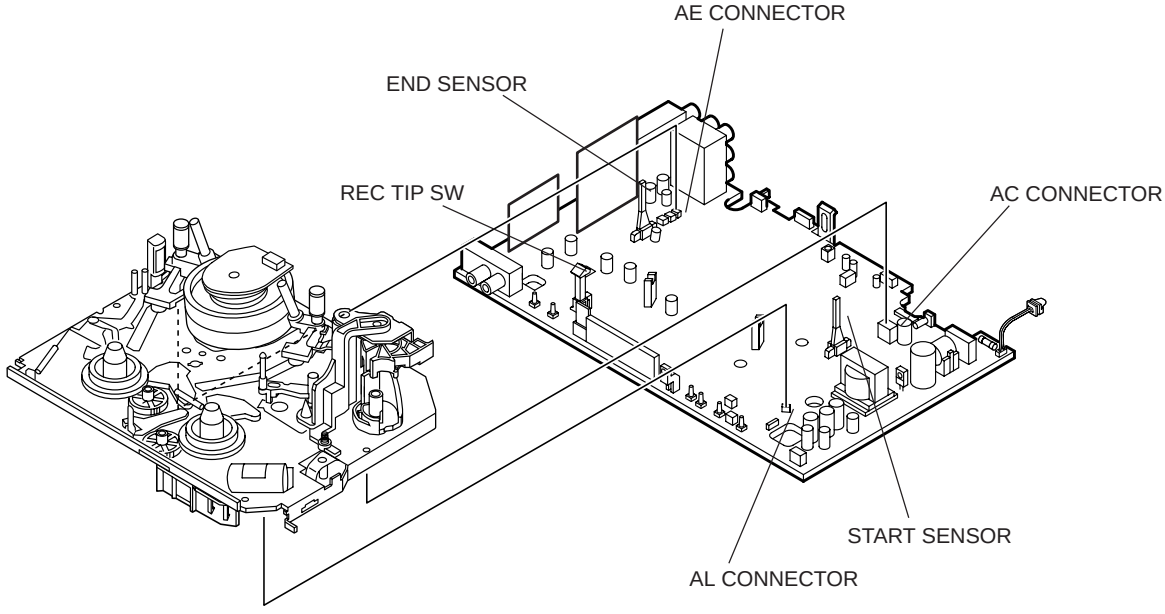


INSTALLING THE MECHANISM ON PWB

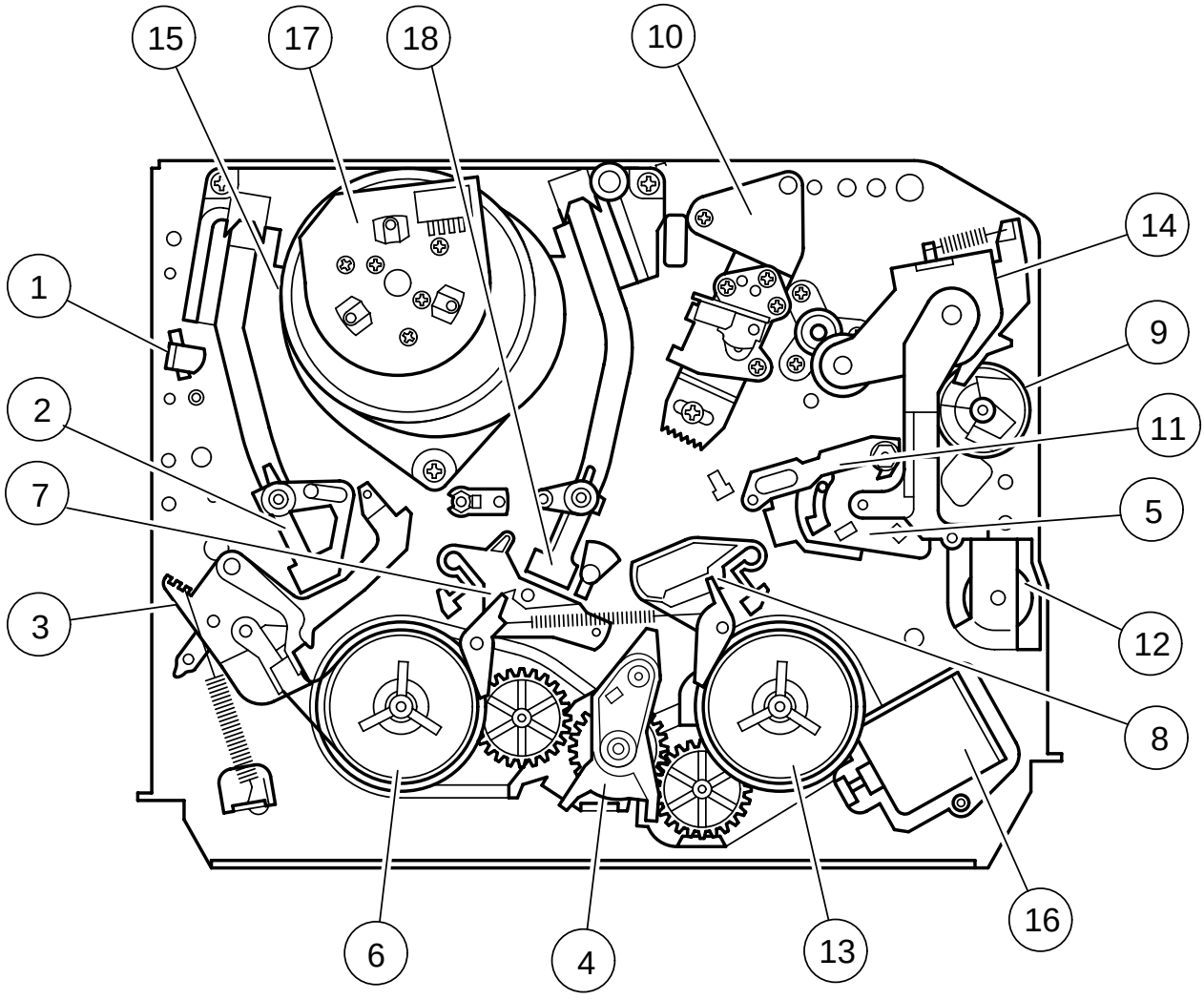
Lower vertically the mechanism, paying attention to the mechanism edge, and install the mechanism with due care so that the parts are not damaged. So as to fix the mechanism to the main PWB install two housings. (Fit the antenna cover to one of them. For other, fix the vicinity of loading motor and solder joint side of main PWB.) Connect again the FFC cable (AA-MH, AD-ME, AH-MH) between the mechanism and the main PWB.

PARTS WHICH NEED PARTICULAR CARE

When installing the mechanism chassis on the PWB unit, take care so as to prevent deformation due to contact of mechanism chassis with REC TIP SW.

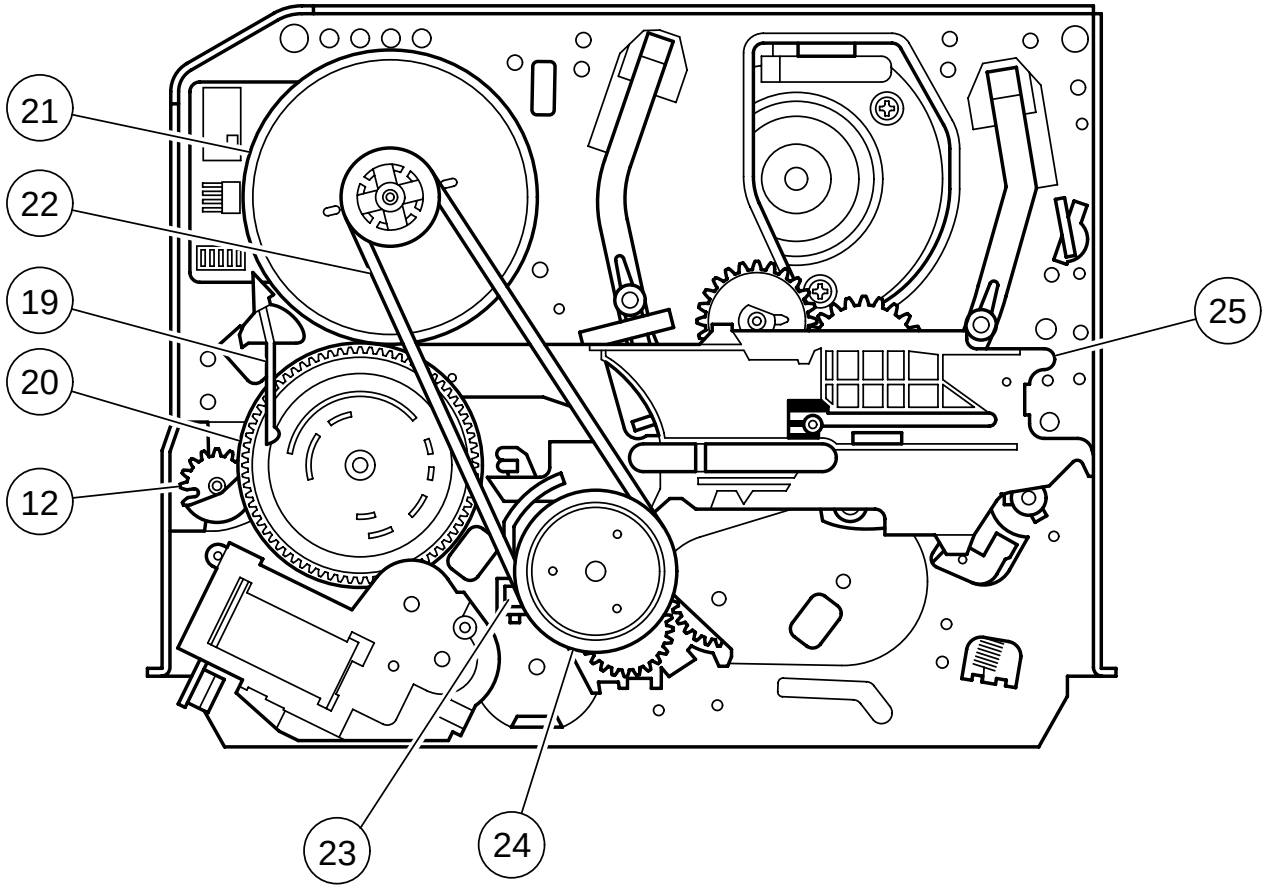


3. FUNCTION OF MAJOR MECHANICAL PARTS (TOP VIEW)



No.	Function	No.	Function
1	Full erase head	11	Reverse guide lever ass'y
2	Supply pole base ass'y	12	Casecon drive gear
3	Tension arm ass'y	13	Take-up reel disk
4	Idler wheel ass'y	14	Pinch roller lever ass'y
5	Pinch drive lever ass'y	15	Drum ass'y
6	Supply reel disk	16	Loading motor
7	Supply main brake ass'y	17	Drum motor
8	Take-up main brake ass'y	18	Take-up pole base ass'y
9	Pinch drive cam		
10	A/C Head ass'y		

FUNCTION OF MAJOR MECHANICAL PARTS (BOTTOM VIEW)



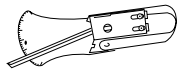
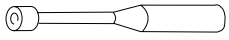
No.	Function	No.	Function
19	Slow brake lever	23	Clutch lever
20	Master cam	24	Limiter pulley ass'y
21	Capstan D.D. motor	25	Shifter
22	Reel belt		

4. ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS

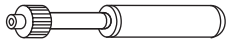
The explanation given below relates to the on-site general service (field service) but it does not relates to the adjustment and replacement which need high-grade equipment, jigs and skill. For example, the drum assembling, replacement and adjustment service must be performed by the person who have finished the technical courses.

4-1 MECHANISM CONFIRMATION ADJUSTMENT JIG

So as to perform completely the mechanism adjustment prepare the following special jigs. So as to maintain the initial performance of the machine the maintenance and check are necessary. Utmost care must be taken so that the tape is not damaged. If adjustment needs any jig, be sure to use the required jig.

No.	Jig Item	Part No.	Code	Configuration	Remarks
1.	Torque Cassette Meter	JiGVHT-063	CZ		This cassette torque meter is used for checking and adjusting the torque of take-up for measuring tape back tension.
2.	Torque Gauge	JiGTG0090	CM		These Jigs are used for checking and adjusting the torque of take-up and supply reel disks.
		JiGTG1200	CN		
3.	Torque Gauge Head	JiGTH0006	AW		
4.	Torque Driver	JiGTD1200	CB		When fixing any part to the threaded hole using resin with screw, use the jig. (Specified torque 5 kg)
5.	Master Plane Jig and Reel Disk Height Adjusting Jig	JiGRH0002	BR		These Jigs are used for checking and adjusting the reel disk height.
		JiGMP0001	BY		
6.	Tension Gauge	JiGSG2000	BS		There are two gauges used for the tension measurements, 300 g and 2.0kg.
		JiGSG0300	BF		
7.	Pinch pressing force measuring jig	JiGADP003	BK		This Jig is used with the tension gauge. Rotary transformer clearance adjusting jig.
8.	Reverse guide height adjusting box driver	JiGDRiVER11055	AR		This Jig is used for height adjustment of the reverse guide (for reverse guide height adjustment).
9.	Alignment Tape	VROCPSV	CK		This tape is especially used for electrical fine adjustment.

Video	Audio	Track
625 Monoscope	6kHz	49μm
PAL Colour bar	1kHz	49μm

10.	Guide roller height adjustment drive	JiGDRiVERH-4	AP		This screwdriver is used for adjusting the guide roller height.
11.	X value adjustment gear type screw driver	JiGDRiVER-6	BM		For X value adjustment
12.	Reverse Guide Height Adjusting Jig	JiGRVGH-F18	BU		This Jig is used for height adjustment of the reverse guide.

MAINTENANCE CHECK ITEMS AND EXECUTION TIME

Perform the maintenance with the regular intervals as follows so as to maintain the quality of machine.

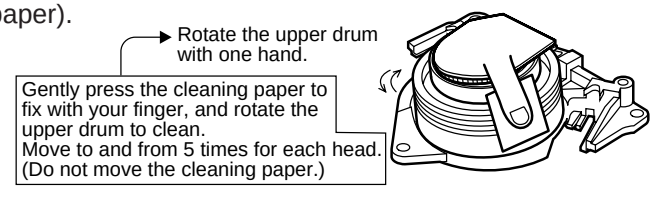
Parts \ Maintained	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	Possible symptom encountered	Remarks
Guide roller ass'y	□	□	□	□	Lateral noises Head occasionally blocked	Abnormal rotation or significant vibration requires replacement.
Sup guide shaft	□	□	□	□		Clean tape contact part with the specified cleaning liquid.
Reverse guide	□	□	□	□		
Slant pole on pole base	□	□	□	□		
Full erase head	□	□	□	○	color and beating	Clean tape contact area with the specified cleaning liquid.
A/C head	□	□	□	○	Small sound or sound distortion	
Upper and lower drum ass'y	□	○□	○□	○□	Poor S/N ratio, no color Poor flatness of the envelope with alignment tape	
Capstan D.D. motor	□	□	□	□	No tape running, uneven color	
Pinch roller	□	□	□	□	No tape running, tape slack	Clean rubber and rubber contact area with the specified cleaning liquid.
Reel belt		□		○	No tape running, tape slack, no fast forward/ rewind motion	
Tension band ass'y				○	Screen swaying	
Loading motor				○	Cassette not loaded or unloaded	
Idler ass'y				○	No tape running, tape slack	
Limiter pulley		□△		□○		
Supply/take-up main brake levers				○	Tape slack	

NOTE ○ : Part replacement. □ : Cleaning △ : Apply grease
<Specified> Cleaning liquid Industrial ethyl alcohol

* This mechanism does not need electric adjustment with variable resistor. Check parts. If any deviation is found, clean or replace parts.

Video head cleaning procedure

1. Apply one drop of cleaning liquid to the cleaning paper with the baby oiler.
2. Gently press the cleaning paper against the video head to fix your finger, and move the upper drum so that each head is passed to and from 5 times (do not move the cleaning paper).
3. Wipe with the dry cleaning paper.



Notes :

- Use the commercially available ethanol of Class 1 as cleaning liquid.
- Since the video head may be damaged, do not move up and down the cleaning paper.
- Whenever the video head is cleaned, replace the cleaning paper.
- Do not apply this procedure for the parts other than the video head.

Parts Code	Description	Code
ZPAPRA56-001E	Cleaning Paper	AW
ZOiLR-02-24TE	Babe Oiler (Spoit)	AH

REMOVING AND INSTALLING THE CASSETTE HOUSING

• Removal

1. In the cassette removing mode, remove the cassette.
2. Unplug the power cord.
3. Remove in the following numerical order.
   a) Remove two screws ①.
   b) Slide and pull up the cassette housing control.

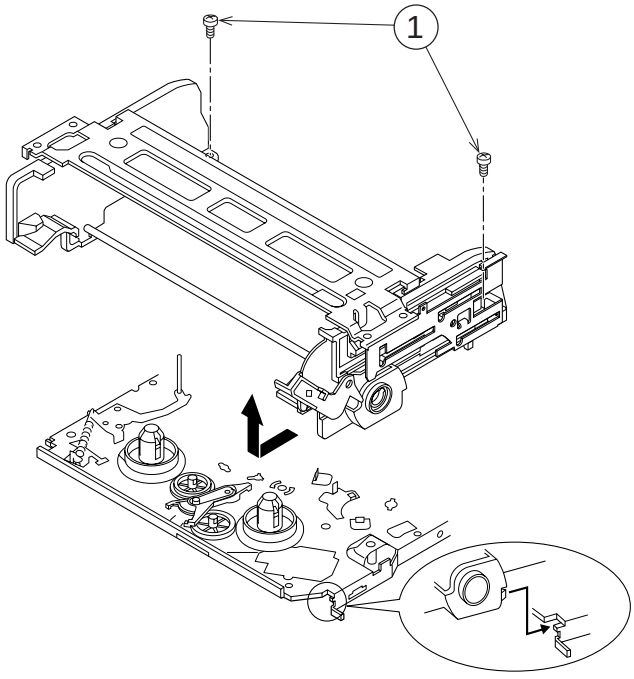


Figure 4-1.

• Reassembly

1. Before installing the cassette housing control, short-circuit TP801 provided at the center (when facing to the main PWB), press the eject button. The casecon drive gear turns and stops when the positioning mark appears. Engage two teeth of casecon drive gear with the three teeth of casecon drive angle gear, and set on the mechanism chassis as shown below.

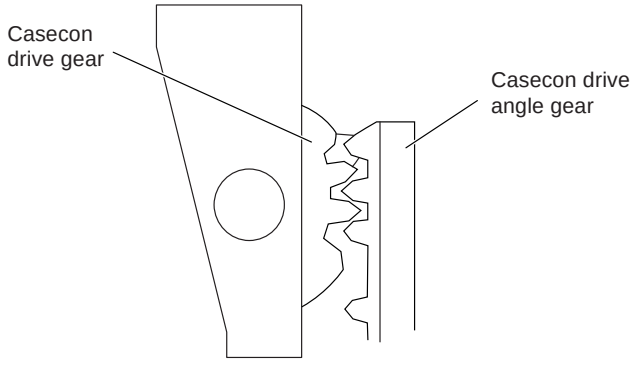


Figure 4-2.

2. Install in the reverse order of removal.

Notes:

1. When fitting the S/E sensor holder to the cassette controller frame L/R, take care.
2. Misengagement of teeth of casecon drive gear and drive angle gear causes malfunction. (The cassette cannot be set, load and ejection are repeated).
3. In the case when you use the magnet screw driver, never approach the magnet driver to the A/C head, FE head, and drum.
4. When installing or removing, take care so that the cassette housing control and tool do not contact the guide pin or drum.
5. After installing the cassette housing control once perform cassette loading operation.

TO RUN A TAPE WITHOUT THE CASSETTE HOUSING CONTROL ASSEMBLY

1. Remove the full-surface panel.
2. Short-circuit TP801.
3. Plug in the power cord.
4. Turn off the power switch.
   (The pole bases move into U.L.position.)
5. Open the lid of a cassette tape by hand.
6. Hold the lid with two pieces of vinyl tape.
7. Set the cassette tape in the mechanism chassis.
8. Stabilize the cassette tape with a weight (500g) to prevent floating.
9. Turn on the power switch.
10. Perform running test.

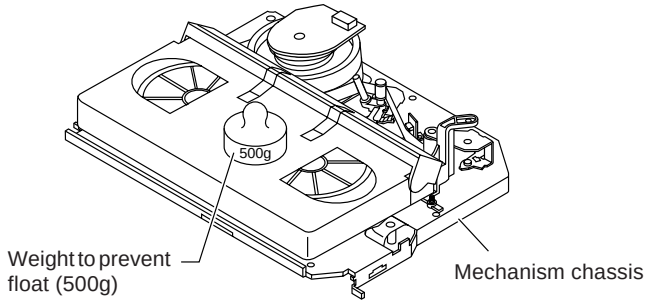


Figure 4-3.

Note:
The weight should not be more than 500g.

To take out the cassette tape.

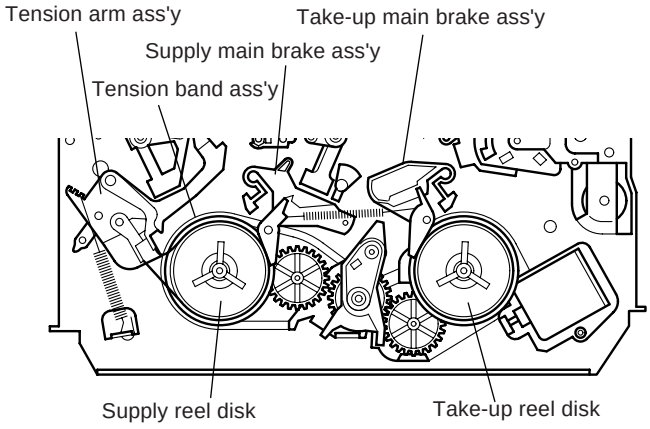
1. Turn off the power switch.
2. Take out the cassette tape.

REEL DISK REPLACEMENT AND HEIGHT CHECK

- **Removal**

1. Remove the cassette housing control assembly.
2. Pull the tension band out of the tension arm ass'y.
3. Remove the Supply/Take-up main brake ass'y.
4. Open the hook at the top of the reel disk, and remove the reel disk.

Note:
Take care so that the tension band ass'y and main brake ass'y (especially soft brake) are not deformed.



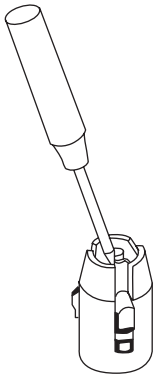


Figure 4-4.

Note:
When the tension band ass'y is pressed in the direction of the arrow for removal, the catch is hard to be deformed.

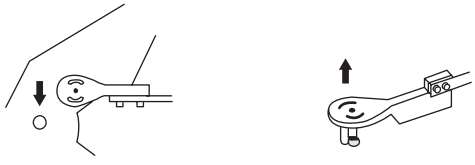


Figure 4-5.

- **Reassembly (Supply reel disk)**

1. Clean the reel disk shaft and apply grease (SC-141) to it.
2. Match the phases of reel disk and reel relay gear, and set the new reel disk.
3. After checking the reel disk height, wind the tension band ass'y around the reel disk, and insert into the hole of tension arm ass'y.
4. Assemble the Supply main brake ass'y.

Notes:
1. When installing the reel disk, take due care so that the tension band ass'y is not deformed and grease does no adhere.
2. Do not damage the Supply main brake ass'y. Be careful so that grease does not adhere to the brake surface.

- **Reassembly (Take-up reel disk)**

1. Clean the reel disk shaft and apply grease (SC-141) to it.
2. Align the phase of the reel disk to that of the reel relay gear and to install a new take-up reel disk onto the shaft.
3. Check the reel disk height and reassemble the take-up main brake ass'y.

Note:
1. Take care so that the Take-up main brake ass'y is not damaged. Take care so that grease does not adhere the brake surface.
2. After reassembly, check the video search rewind back tension (see page 15), and check the brake torque (see page 17).

- **Height checking and adjustment**

Note:
1. Set the master plane with due care so that it does not contact the drum.
2. When putting the master plane, shift the reverse guide a little in the loading direction. Care must be taken since excessive shift results in damage.

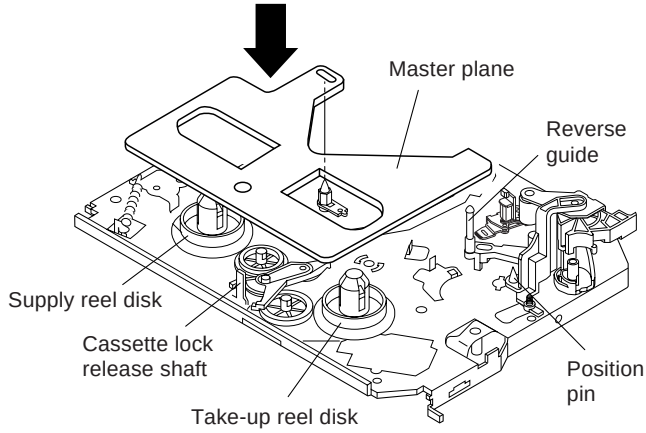


Figure 4-6.

Note:
- Check that the reel disk is lower than part A but higher than part B. If the height is not correct, readjust the reel disk height by changing the poly-slider washer under the reel disk.

Note:
Whenever replacing the reel disk, perform the height checking and adjustment.

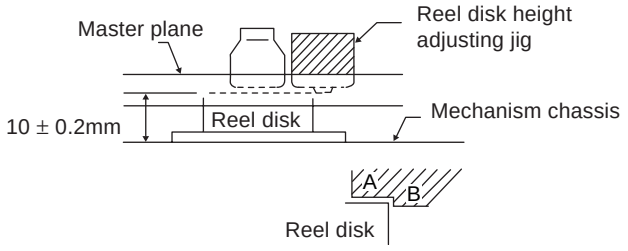


Figure 4-7.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN FAST FORWARD MODE

- **Remove the cassette housing control assembly.**

- **After short-circuiting TP801 provided at the center (facing to the main PWB), plug in the power cord.**

- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
2. Press the FF button.
3. To calculate the remaining capacity of the play back mode, slowly rotate the supply reel disk, and then shift it into the forward mode.

- **Checking**

1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the CW direction.
2. Make sure that the indication of torque gauge is not less than 30mN·m (306gf·cm).

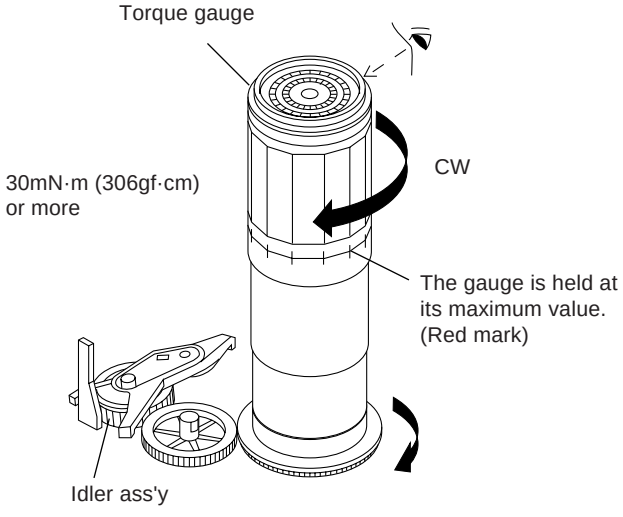


Figure 4-8.

- **Adjustment**

1. If the FF winding-up torque is less than the specified value, clean the capstan D.D. motor pulley, reel belt, and limiter pulley with cleaning liquid, and check again.
2. If the torque is less than the set value, replace the reel belt.

Notes:
1. Hold the torque gauge by hand so that it is not moved.
2. Do not keep the reel disk in lock state. Do not allow long-time measurement.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN REWIND MODE

- **Remove the cassette housing control assembly.**

- **After short-circuiting TP801 provided at the center (facing to the main PWB), plug in the power cord.**

- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
2. Press the rewind button.
3. To calculate the remaining capacity, slowly rotate the take-up reel disk, and then shift it into the rewind mode.

- **Checking**

1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the CCW direction.
2. Make sure that the indication of torque gauge is not less than 30mN·m (306gf·cm).

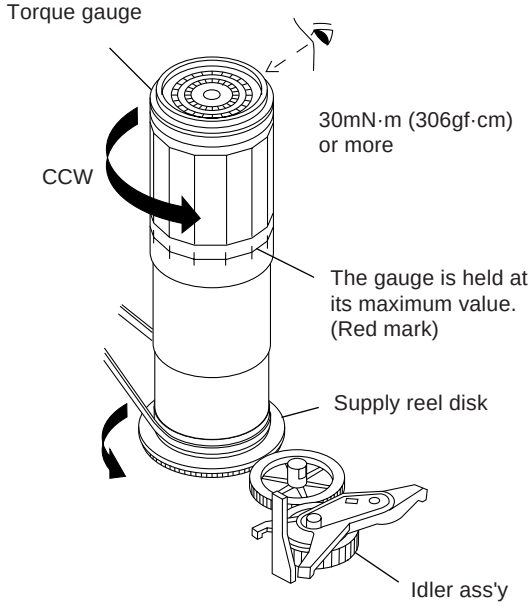


Figure 4-9.

- **Adjustment**

1. If the rewind winding-up torque is less than the specified value, clean the capstan D.D. motor pulley, drive belt, and limiter pulley with cleaning liquid, rewind again, and check the winding-up torque.
2. If the winding-up torque is still out of range, replace the drive belt.

Notes:
1. Hold the torque gauge by hand so that it is not moved.
2. Do not keep the reel disk in lock state. Do not allow long-time measurement.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN RECORD/PLAYBACK MODE

- **Remove the cassette housing control assembly.**
- **After short-circuiting TP801 provided at the center (facing to the main PWB), plug in the power cord.**
- **Turn off the power switch.**
- **Open the cassette torque meter lid, and fix it with tape.**
- **Load the cassette torque meter into the unit.**
- **Put the weight (500g) on the cassette torque meter.**
- **Turn on the power switch.**
- **Press the REC button, and set SP picture record mode.**

Set value SP7.8 ± 3mN·m (80 ± 30 gf·cm)

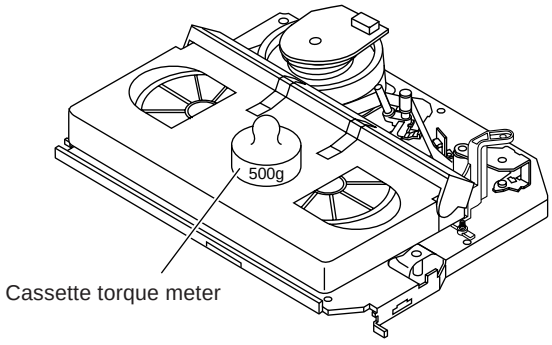


Figure 4-10.

- **Checking**

1. Make sure that value is within the setting 7.8 ± 3 mN·m (80 ± 30 gf·cm).
2. The winding-up torque fluctuates due to variation of rotation torque of limiter pulley ass'y. Read the center value of fluctuation as setting.
3. Set the SP record mode and make sure that the winding-up torque is within setting.

- **Adjustment**

If the playback winding-up torque is not within the setting, replace the limiter pulley assembly.

Note:
When the torque cassette is set, put a weight (500g) to prevent rise.
When the cassette torque meter is taken out.
Turn off the power switch.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN VIDEO SEARCH REWIND MODE

- **Remove the cassette housing control assembly.**
- **After short-circuiting TP801 provided at the center (facing to the main PWB), plug in the power cord.**
- **Setting**

Press the playback button and rewind button to set the video search rewinding mode.

- **Checking**

Place the torque gauge on the supply reel disk, and turn it counterclockwise very slowly (one rotation every 1 to 2 seconds) and check that the torque is within the set value 14.0 ± 3.9mN·m. (144 ± 40gf·cm)

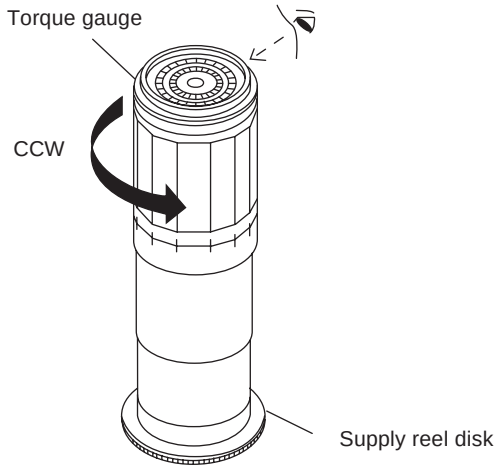


Figure 4-11.

Note:
Surely put the torque gauge on the reel disk to measure. If the torque gauge is raised, accurate measurement is impossible.

- **Adjustment**

If the rewinding playback winding-up torque is not within the setting, replace the limiter pulley assembly.

Note:
The winding-up torque fluctuates due to variation of rotation torque of supply reel disk. Read the center value of fluctuation as setting.

CHECKING THE VIDEO SEARCH REWIND BACK TENSION

- **Remove the cassette housing control assembly.**

- **After short-circuiting TP801 provided at the center (facing to the main PWB), plug in the power cord.**

- **Checking**

1. After pressing the play button, press the rewind button, and set the video search rewind mode.
2. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within the set value 3.4±1.5mN·m (35±15gf·cm).

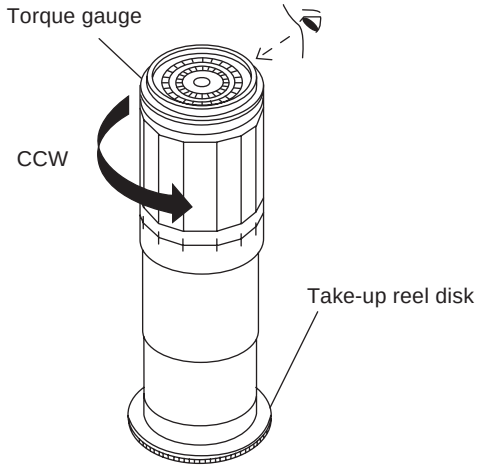


Figure 4-12.

Notes:

Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.

CHECKING THE PINCH ROLLER PRESSURE

- **Remove the cassette housing control assembly.**

- **After short-circuiting TP801 provided at the center (facing to the main PWB), plug in the power cord.**

- **Checking**

Press the play button to set the playback mode.

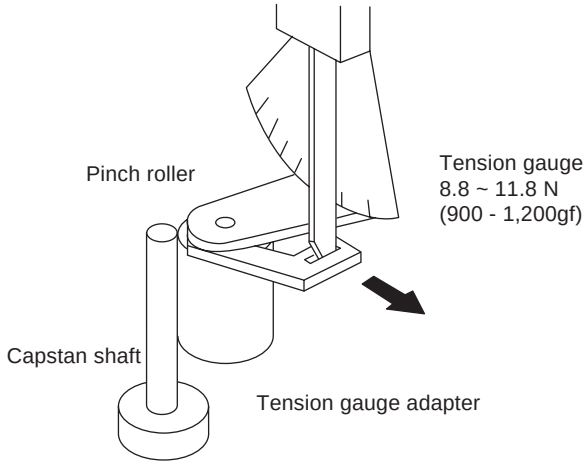


Figure 4-13.

1. Detach the pinch roller from the capstan shaft. Do not separate excessively. Or the pinch lever and pinch double action lever may disengage.
2. Engage the tension gauge adapter with the pinch roller shaft, and pull in the arrow direction.
3. Gradually return the pinch roller, and measure the pulling force when the pinch roller contacts the capstan shaft.
4. Make sure that the measured value is within setting 8.8 to 11.8 N (900 to 1,200gf).

CHECKING AND ADJUSTMENT OF TENSION POLE POSITION

- **Remove the cassette housing control assembly.**

- **After short-circuiting TP801 provided at the center (facing to the main PWB), plug in the power cord.**

- **Setting**

1. Turn off the power switch.
2. Open the cassette tape (E-180), and fix with tape.
3. Set the cassette tape in loading state.
4. Put the weight (500g) on the cassette tape.
5. Turn on the power switch.
6. Make the adjustment with the beginning of a E-180 tape.

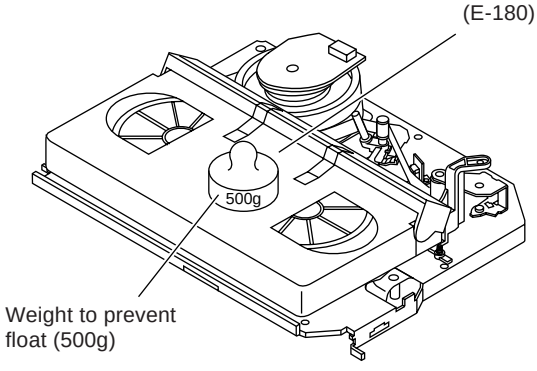
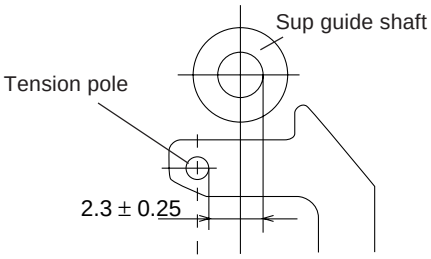


Figure 4-14.

- **Checking**

1. Set a cassette tape, push the REC button to place the unit in the SP record mode. Now check the tension pole position.

2. Visually check to see if the right edge of the tension pole is within the 2.3 ± 0.25 from the right edge of the Sup guide shaft.



Make the adjustment with the beginning of a E-180 tape.

Figure 4-15.

At left side from the center line

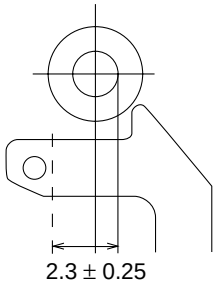


Figure 4-16.

Insert the slotted screwdriver in the tension pole adjuster, and rotate counterclockwise.

At right side from the center line

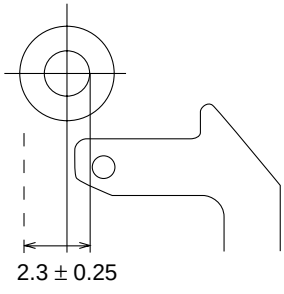


Figure 4-17.

Insert the slotted screwdriver in the tension pole adjuster, and rotate clockwise.

Tension pole adjuster adjusting range

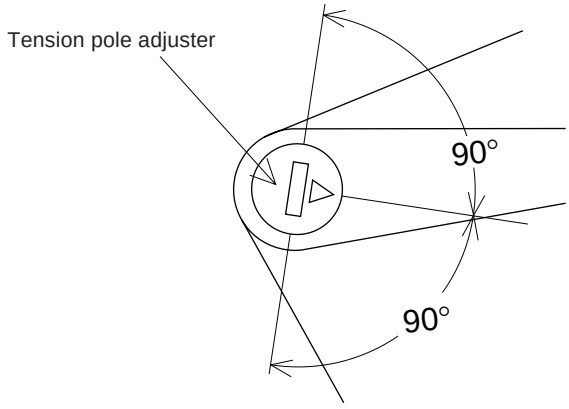


Figure 4-18.

Adjust so that the delta mark of tension pole adjuster is within 90° range (left, right).

CHECKING AND ADJUSTMENT OF RECORD/ PLAYBACK BACK TENSION

- **Remove the cassette housing control assembly.**
- **After short-circuiting TP801 provided at the center (facing to the main PWB), plug in the power cord.**
- **Setting**

1. Turn off the power switch.
2. Open the torque cassette meter and fix with tape.
3. Set the cassette tape in loading state.
4. Put the weight (500g) on the cassette torque meter.
5. Turn on the power switch.

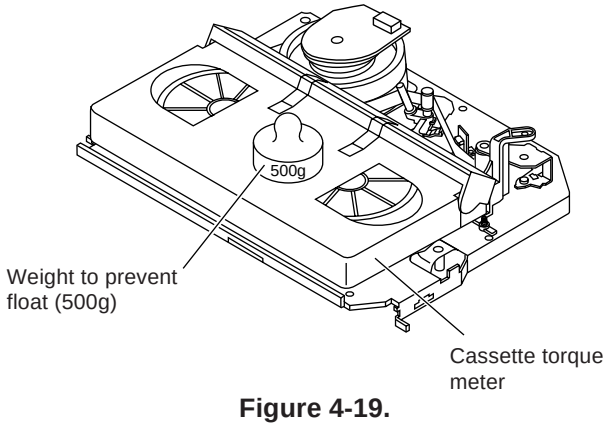


Figure 4-19.

- **Checking**

1. Push the REC button to place the unit in the SP record mode.
2. At this time ascertain that the back tension is within the setting (36.5 to 52g·cm) by seeing the indication of torque cassette meter.

- **Adjustment**

1. If the indication of torque cassette meter is lower than the setting, shift the tension spring engagement to the part A.
2. If the indication of torque cassette meter is higher than the setting, shift the tension spring engagement to the part B.

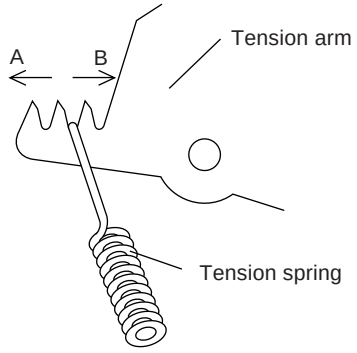
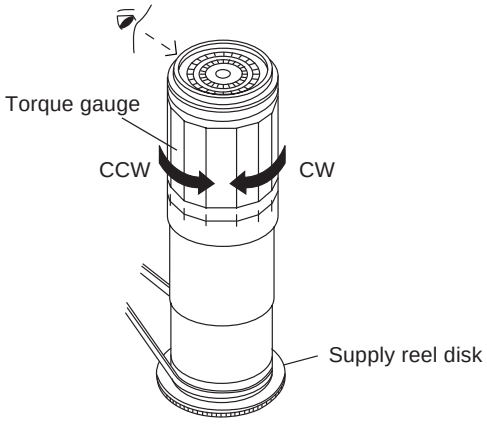


Figure 4-20.

CHECKING THE BRAKE TORQUE

- **Checking the brake torque at the supply side**



CCW:	2.9~9.8mN·m (30~100gf·cm)
CW:	4.9~13.7mN·m (50~140gf·cm)

Figure 4-21.

- **Remove the cassette housing control assembly.**

- **After short-circuiting TP801 provided at the center (facing to the main PWB), plug in the power cord.**

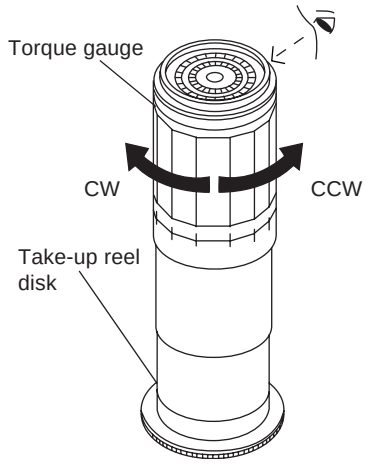
- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
2. Switch from the FF mode to the STOP mode.
3. Disconnect the power cord.

- **Checking**

Turn the torque gauge at a rate of about one turn/2 sec in the CW direction/CCW direction with respect to the supply reel disk so that the reel disk and torque gauge pointer rotate at equal speed, and make sure that the value is within the setting (CW direction: 4.9 to 13.7mN·m (50 to 140gf·cm); CCW direction: 2.9 to 9.8mN·m (30 to 100gf·cm).

- **Checking the brake torque at the take-up side**



CCW:	4.9~13.7mN·m (50~140gf·cm)
CW:	3.9~10.8mN·m (40~110gf·cm)

Figure 4-22.

- **Remove the cassette housing control assembly.**

- **After short-circuiting TP801 provided at the center (facing to the main PWB), plug in the power cord.**

- **Setting**

1. Switch from the FF mode to the STOP mode.
2. Disconnect the power cord.
3. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.

- **Checking**

1. Turn the torque gauge at a rate of about one turn/2 sec in the CCW direction/CW direction so that the reel disk and torque gauge pointer rotates at equal speed and make sure that the value is within the setting (CCW direction: 4.9 to 13.7mN·m (50 to 140gf·cm), CW direction: 3.9 to 10.8 mN·m (40 to 110gf·cm).

2. Adjustment of the brake torque at the supply side and the take-up side

- Unless the supply side brake torque or take-up side brake torque is within the setting, clean the felt surface of reel disk (supply, take-up) brake lever, check again the brake torque.
- If value cannot be set within the setting yet, replace the main brake ass'y or main brake spring.

REPLACEMENT OF A/C (Audio/Control) HEAD

1. Remove the cassette housing control assembly.
2. In unloading state unplug the power cord.

- **Removal**

1. Remove the screws ①②③, Azimuth screw, Tilt screw.
2. Unsolder the PWB fitted to the A/C head.

Notes:

1. When replacing, never touch the head. If you touched, clean with the cleaning liquid.
2. When removing the screw ③, take care so that the spring may out.

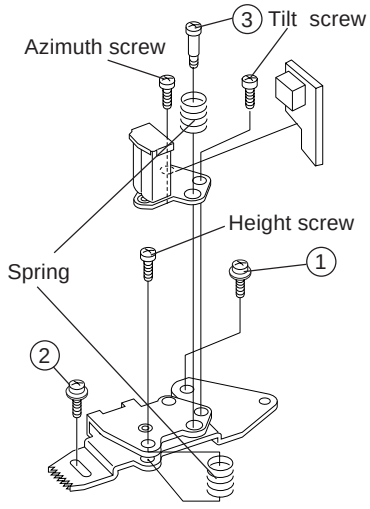


Figure 4-23.

- **Replacement**

1. Solder the removed PWB to the new head assembly.
2. Adjust the height from the A/C head plate (lower surface) to the A/C head base to 10.8mm with slide calipers. (3 places of azimuth screw section, tilt screw section and hight screw section) (See the figure below.)

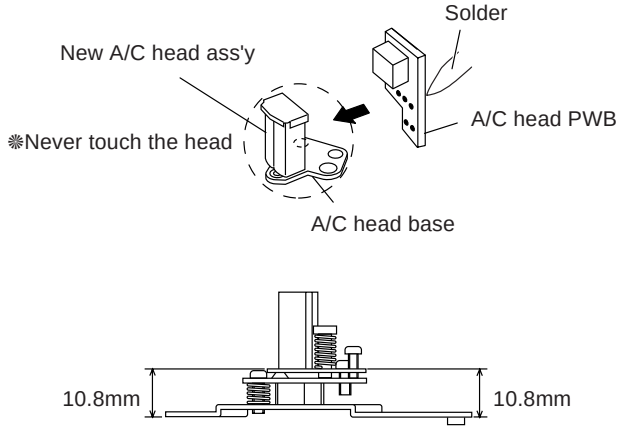


Figure 4-24.

3. Align the left end of gear of A/C head plate with the punched mark of chassis, tentatively tighten the screws ① and ② so as to ensure smooth motion of A/C head plate. Tentative tightening torque must be 0.15 to 0.20 N·m (1.5 to 2.0kgf·cm).

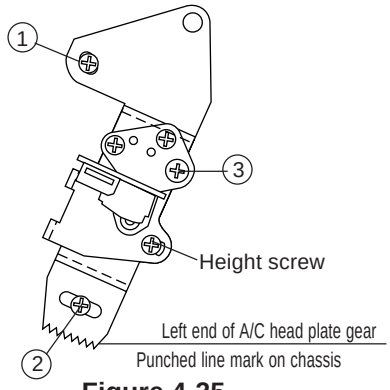


Figure 4-25.

Note:

1. If the screws ① and ② are tighten tentatively too loose, the azimuth and height of A/C head may change when they are finally tightened. Therefore care must be taken.
2. After completion of A/C head be sure to adjust tape running. (Execute the running adjustment by the method described in Page 20, 21.)

A/C HEAD HEIGHT ROUGH ADJUSTMENT

- **Setting**

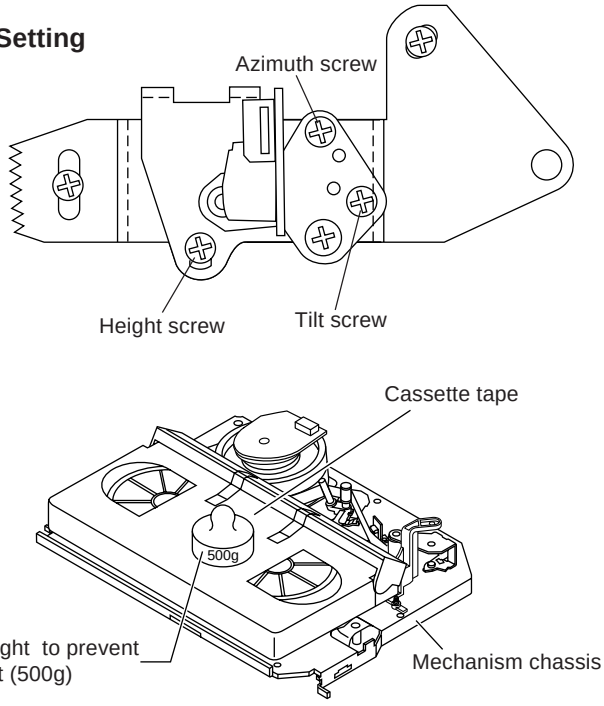


Figure 4-26.

1. Set the cassette tape in the unit.
2. Press the PLAY button to put the unit in the playback mode.
3. Roughly adjust the height of the A/C head by turning the height screw until the tape is in the position shown below.

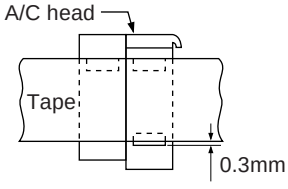


Figure 4-27.

- **Adjustment**

Adjust the height screw visually so that the control head is visible 0.3mm below the bottom of the tape.

HEIGHT ADJUSTMENT OF REVERSE GUIDE

1. Adjust the height from the mechanism chassis to the reverse guide lower flange to 13.38 mm, using the reverse guide height adjustment jig, in tape loading state. (Refer to Figure 4-28 (a) (b).)

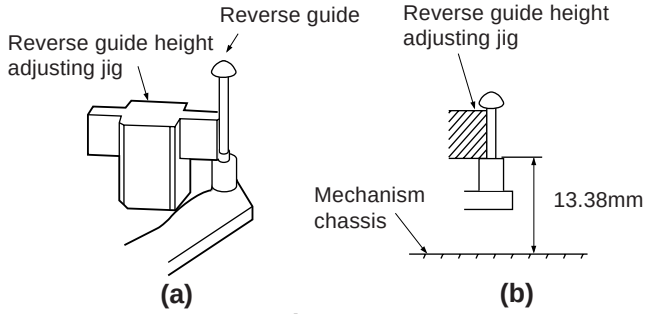


Figure 4-28.

2. Rotate counterclockwise the reverse guide height adjustment nut 1/10 turn. (For height adjustment use the reverse guide height adjustment box driver (JiGDRiVER11055)).

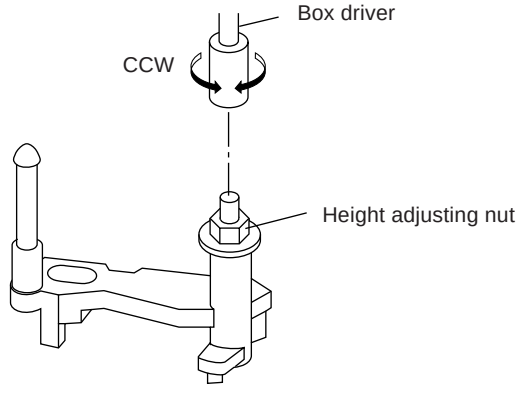
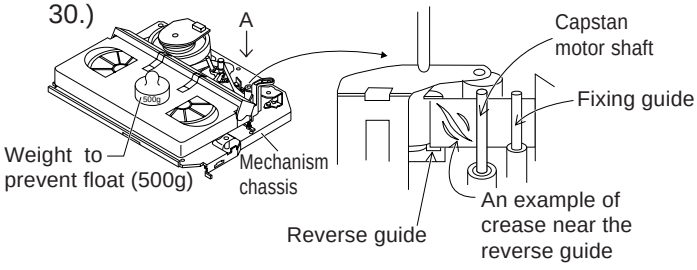


Figure 4-29.

3. Set the tape, and check for tape crease near the reverse guide in the playback mode.
   If crease is found, turn the reverse guide adjustment nut to remove crease. (As for crease check refer to Figure 4-30.)



* Check for crease from the A direction.

Figure 4-30.

ADJUSTMENT OF TAPE DRIVE TRAIN

1. Tape run rough adjustment
   ① Remove the cassette housing control assembly.
   ② After shortcircuiting TP801 provided at the center (facing to the main PWB), plug in the power cord.
   ③ Check and adjust the position of the tension pole. (See page 15.)
   ④ Check and adjust the video search rewind back tension. (See page 15.)
   ⑤ Connect the oscilloscope to the test point for PB CHROMA envelope output (TP201). Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP202).
   ⑥ Set the alignment tape (VROCPSV) to play. (Put a 500g weight on the cassette tape to prevent lift of cassette tape.)

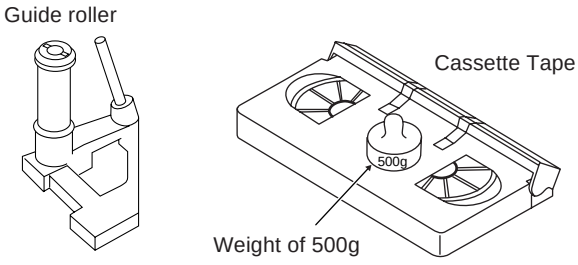


Figure 4-31.

   ⑦ Press the tracking button (+), (–) and change the envelope waveform from max to min and from min to max. At this time make sure that the envelop waveform changes nearly parallel.
   ⑧ Unless the envelope waveform changes nearly parallel, adjust the height of supply side and take-up side guide roller so that the envelope waveform changes nearly parallel. (For envelop adjustment procedure refer to Figure 4-35.)
   ⑨ Turn the tilt screw to remove the tape crease at the fixing guide flange.
   Playback the tape and check for tape crease at the fixing guide flange.
   (1) If there is no tape crease
   Turn the tilt screw clockwise so that tape crease appears once at the flange, and then return the tilt screw so that the crease disappears.
   (2) If there is tape crease
   Turn counterclockwise the tilt screw so that the tape crease disappears.
   (Reference) If the tilt screw is turned clockwise crease appears at the lower flange.

Notes:
1. Previously set the tracking control in the center position, and adjust the envelop waveform to maximum with X value adjustment nut. Thereby the tape run rough adjustment is facilitated.
2. Especially the outlet side envelope waveform must have higher flatness.

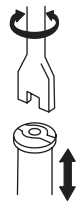


Figure 4-32.

2. Adjustment of A/C head height and azimuth
   ① Perform the initial setting of A/C head position by the method stated in "Page 18 Replacement 3".
   ② Connect the oscilloscope to the audio output terminal.
   ③ Using the alignment tape in which 1 kHz linear audio signal has been recorded, adjust the height screw so as to get max audio output.
   ④ Using the alignment tape in which 6 kHz linear audio signal has been recorded, adjust the azimuth screw so as to get max audio output.
   ⑤ Repeat the above adjustment steps ③ and ④ a couple of times. Finally take the step ④ again.

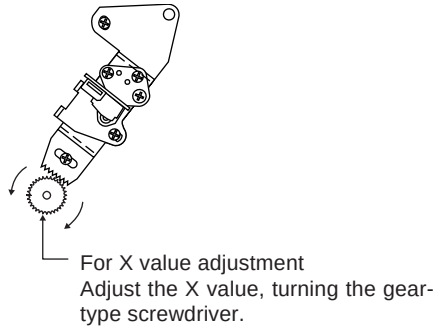
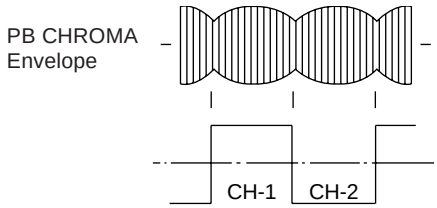


Figure 4-33.

3. Tape run adjustment
   ① Connect the oscilloscope to PB CHROMA envelope output test point, set oscilloscope sync to EXT, trigger-input the PB CHROMA signal (head switching pulse).
   ② Rough adjustment of X value
   Tentatively fix A/C head arm screws ① and ② by the method described in Page 18 "Replacement 3".
   Playback the alignment tape (VROCPSV) and shortcircuit TP802. As a result the auto-tracking is automatically cancelled, so that the X value adjustment mode is set.
   Move the A/C head with the X value adjustment gear driver (JiGDRiVER-6) by the method shown in Figure 4-33, and adjust the A/C head so as to get the maximum envelope waveform. (Note: When the A/C head is adjusted, adjust so that the maximum envelop waveform is obtained nearest the position of initial setting made in Page 18.)

③ Next, press the tracking button (+), (–) and change the envelope waveform from max to min and from min to max. At this time adjust the height of supply and take-up side guide roller with the adjustment driver (JiGDRiVERH-4) so that the envelope waveform changes nearly parallel.
④ If the tape is lifted or sunk from the helical lead surface, the PB CHROMA envelope waveform appears as shown in Figure 4-35.
⑤ Press the tracking button (+), (–) and make sure that the envelope waveform changes nearly parallel.
⑥ Finally check tape crease near the reverse guide. If tape crease is found, remove it as stated in Page 19 "HEIGHT ADJUSTMENT OF REVERSE GUIDE" item 3.



Head switching pulse

Figure 4-34.

4. A/C head X value adjustment
① Tentatively fix A/C head arm screws ① and ② by the method described in Page 18 "Replacement 3".
② Playback the alignment tape and shortcircuit TP802. As a result the auto-tracking is automatically cancelled, so that the X value adjustment mode is set.
③ Move the A/C head with the X value adjustment gear driver by the method shown in Figure 4-33, and adjust the A/C head so as to get the maximum envelope waveform. (Note: At this time adjust so as to get the maximum envelope waveform nearest the A/C head position which has been set in case of X value rough adjustment as stated in Page 20, 3- ②.)
④ Tighten finally the screws ① and ②. Be sure to tighten at first the screw ① and then the screw ②. Final tightening torque is 0.6N·m (If the screw ② is tightened first, the X value may deviate.)
⑤ Adjust the playback switching point (Refer to the electric adjustment method.)
⑥ Playback the self-picture-recorded tape, and check the flatness of envelope waveform and sound.

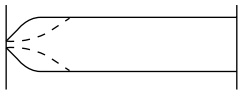
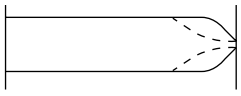
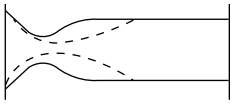
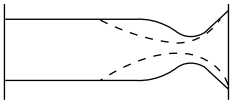
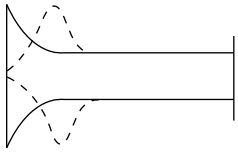
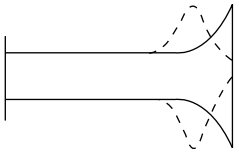
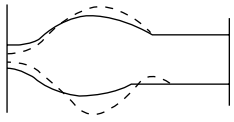
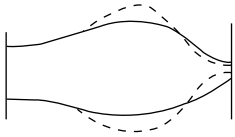
	When the tape is above the helical lead.		When the tape is below the helical lead.	
	Supply side	Take-up side	Supply side	Take-up side
				
				
Adjustment	Supply side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Take-up side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Supply side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The supply side guide roller is then rotated in the clockwise direction to flatten the envelope.	Take-up side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The take-up side guide roller is then rotated in the clockwise direction to flatten the envelope.

Figure 4-35.

Notes:
When the A/C head X value adjustment is performed, be sure to perform at first X value rough adjustment (refer to Page 20, 3-②).

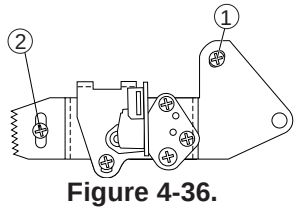


Figure 4-36.

REPLACEMENT OF THE CAPSTAN D.D. (DIRECT DRIVE) MOTOR

- Remove the mechanism from the main PWB (refer to Page 6 item 1. When removing the mechanism from the main PWB").

- **Removal (Follow the order of indicated numbers.)**

1. Remove the reel belt ①.
2. Remove the slow brake lever ②.
3. Remove the three screws ③.

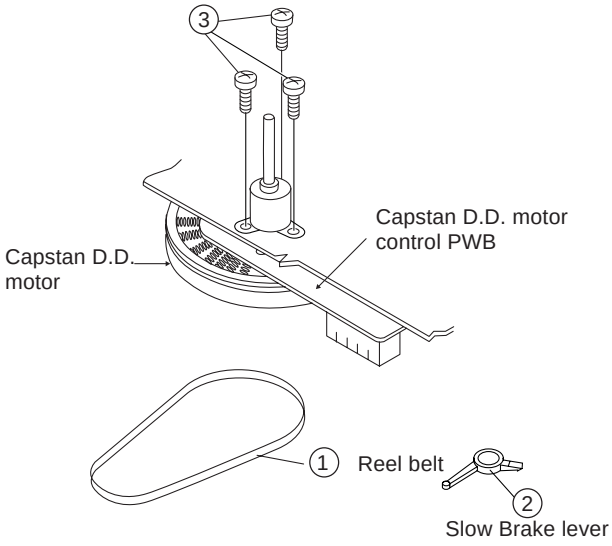


Figure 4-37-1.

- **Reassembly**

1. Taking care so that the capstan shaft does not contact the mechanism chassis, set its position on the mechanism chassis, and then install with the three screws.
2. Install the slow brake lever.
3. Install the reel belt.

Notes:

1. Before installing the capstan D.D. motor, confirm whether an acetate tape (ZTAPEN120020E)is drawn on the back of mechanism chassis.

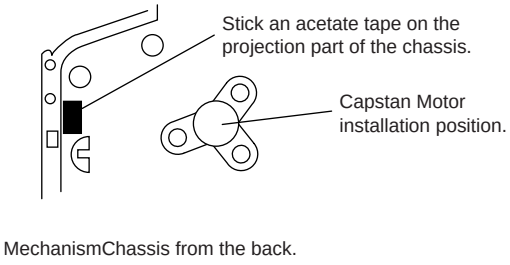


Figure 4-37-2.

2. After installing the capstan D.D. motor, be sure to rotate the capstan D.D. motor and check the movement.
3. Set the tape, and check for the tape crease near the reverse guide in the playback mode. Adjust the A/C head and azimuth as stated in Page 21 Replacement 2. If crease is found, adjust as stated in Page 20 "HEIGHT ADJUSTMENT OF REVERSE GUIDE".

REPLACEMENT OF DRUM D.D. MOTOR

1. Set the ejection mode.
2. Withdraw the main power plug from the socket.

- **Removal (Perform in numerical order.)**

1. Disconnect the FFC cable ①.
2. Unscrew the D.D. stator assembly fixing screws ②.
3. Take out the D.D. stator assembly ③.
4. Unscrew the D.D. rotor assembly fixing screws ④.
5. Take out the D.D. rotor assembly ⑤.

Notes:

1. In removing the D.D. stator assembly, part of the drum earth spring pops out of the pre-load collar. Be careful not to lose it.
2. Install, so that the D.D. rotor ass'y and upper drum ass'y mounting direction check holes align. (Align the upper drum dent with the rotor hole.)
3. Be careful not to damage the upper drum or the video head.
4. Protect the hole elements from shock due to contact with D.D. stator or D.D. rotor ass'y.
5. After installation adjust the playback switching point for adjustment of servo circuit.

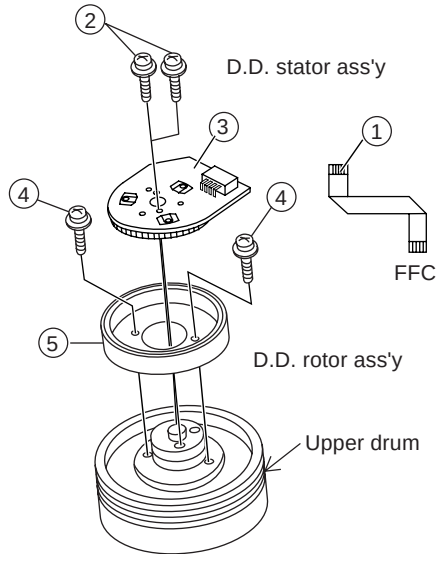


Figure 4-38.

REPLACING THE UPPER AND LOWER DRUM ASSEMBLY

• Replacement (Perform in the numerical order)
① Remove the motor as stated in Page 22 D.D. motor replacement.
② Remove the drum earth brush ass'y ②.
③ Remove the drum base ③ from the upper and lower drum assembly ①.

[Cares when replacing the drum]

1. Be careful so that the drum earth brush is not lost.
2. Do not touch directly the drum surface.
3. Fit gently the screwdriver to the screws.
4. Since the drum assembly is an extremely precise assembly, it must be handled with utmost care.
5. Make sure that the drum surface is free from dust, dirt and foreign substances.
6. After replacing the drum be sure to perform the tape running adjustment.
   After that, perform also the electrical adjustment.
   • Playback switching point adjustment
   • X-position adjustment and check
   • Standard and x-3 slow tracking adjustment
7. After replacing the drum clean the drum.

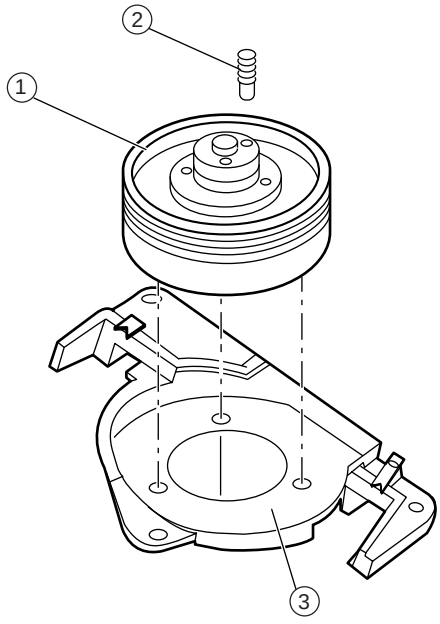


Figure 4-39.

ASSEMBLING OF PHASE MATCHING MECHANISM COMPONENTS

- **Assemble the phase matching mechanism components in the following order.**

1. Assemble the pinch roller assembly and pinch drive cam.
2. Mounting the shifter (on the back of the mechanism chassis).
3. Mounting the master cam (on the back of the mechanism chassis).
4. Assemble the connection gear, slow brake and loading motor parts.

• Pinch drive cam and pinch roller assembling method.

(Place the following parts in position in numerical order.)
(1)Reverse drive lever ①
(2)Reverse guide spring ②
(3)Reverse guide lever ass'y ③
(4)Reverse guide height adjusting nut ④
(5)Pinch drive cam ⑤
(6)Pinch roller ass'y ⑥
(7)Open lever ⑦

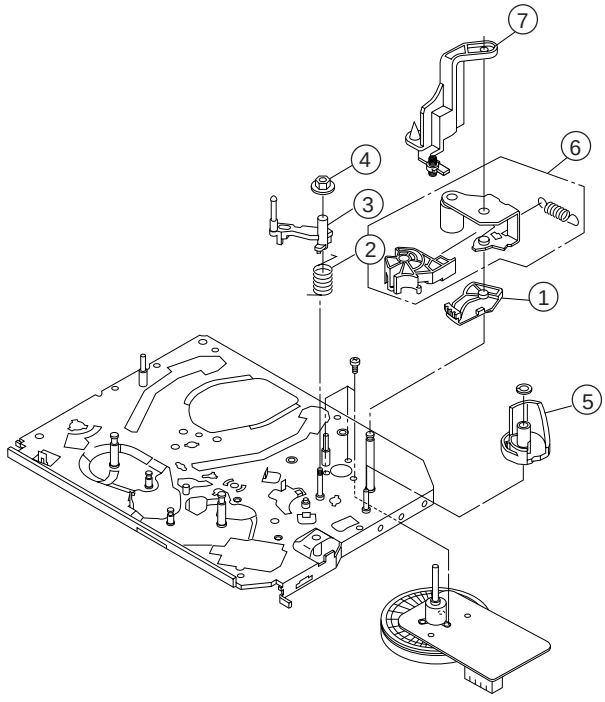


Figure 4-40.

①Insert Reverse Guide Lever Ass'y

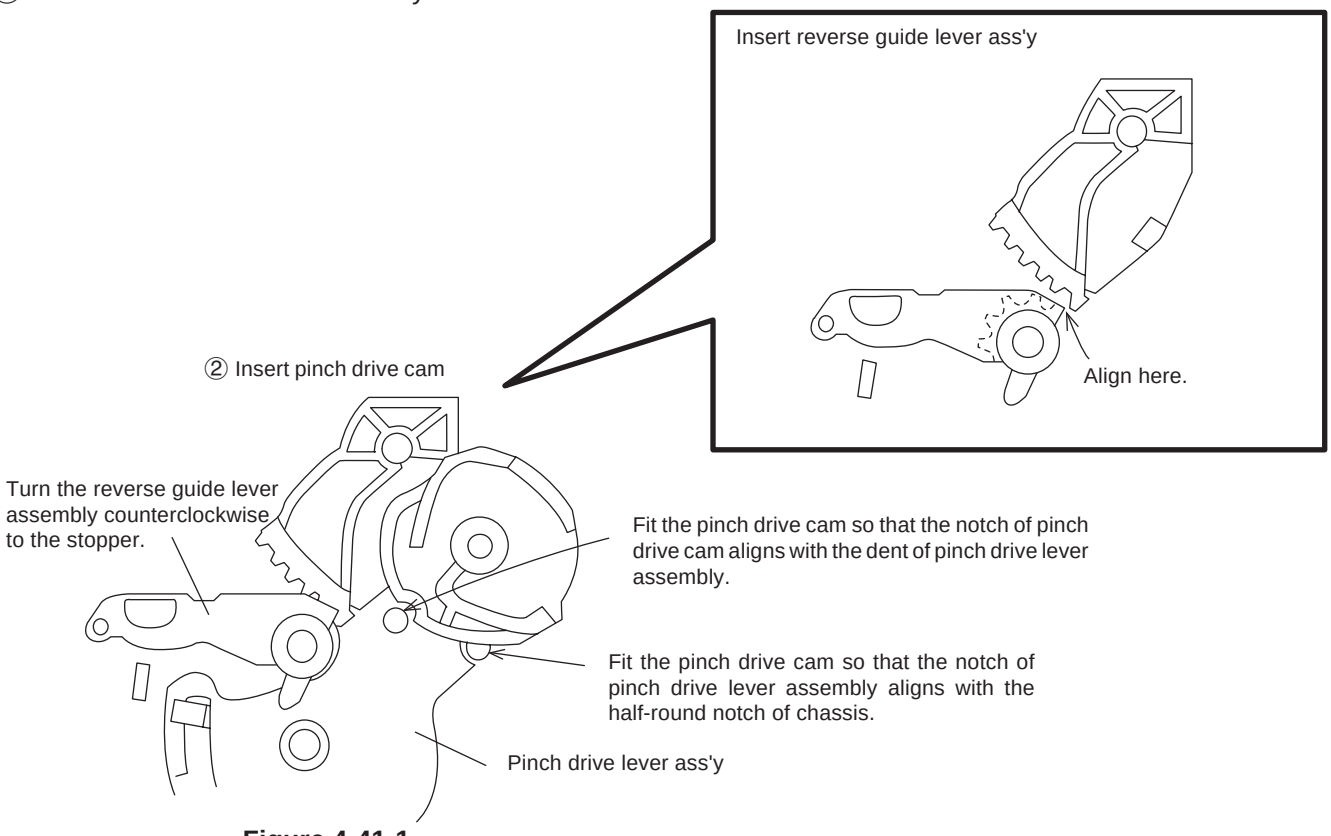


Figure 4-41-1.

②Insert Pinch Roller/Pinch Double Action Lever Ass'y.

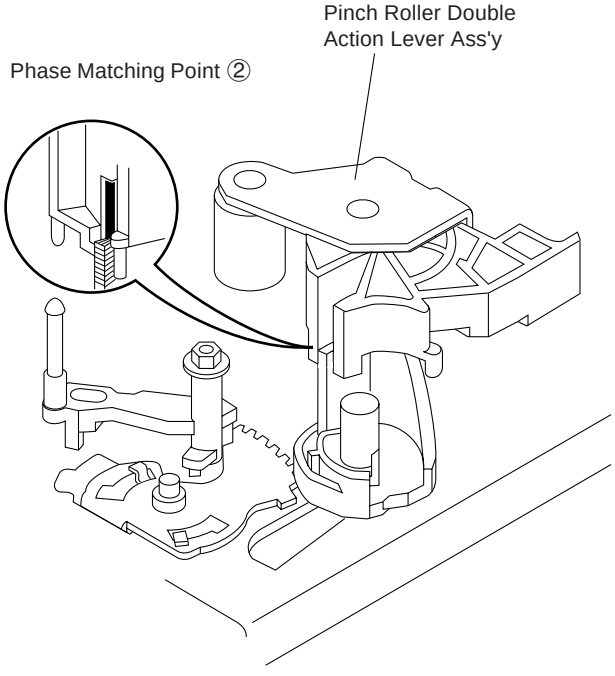


Figure 4-41-2.

③Insert Open Lever.

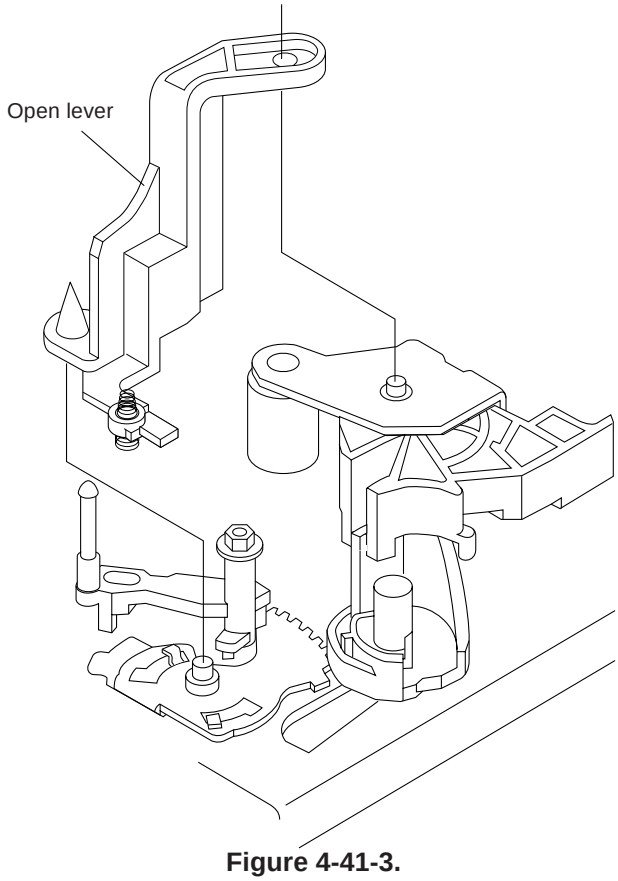
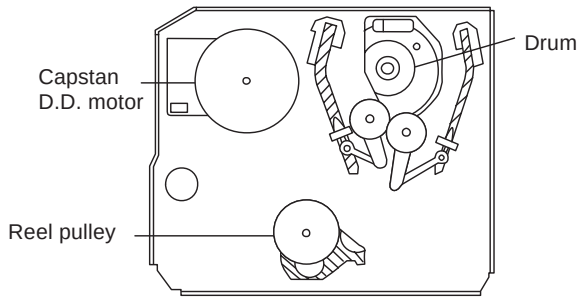


Figure 4-41-3.

INSTALLING THE SHIFTER



(Bottom side of mechanism chassis)

Figure 4-42.

1. Make sure that the loading gear is at the PHASE-MATCHING point ① as shown below.
2. Install, paying attention to insert point ⑤ and release point ③.
3. For the phase matching at the insert point ①, see the PHASE-MATCHING point ② as shown below.
4. Finally fix the inserts ① and ④.

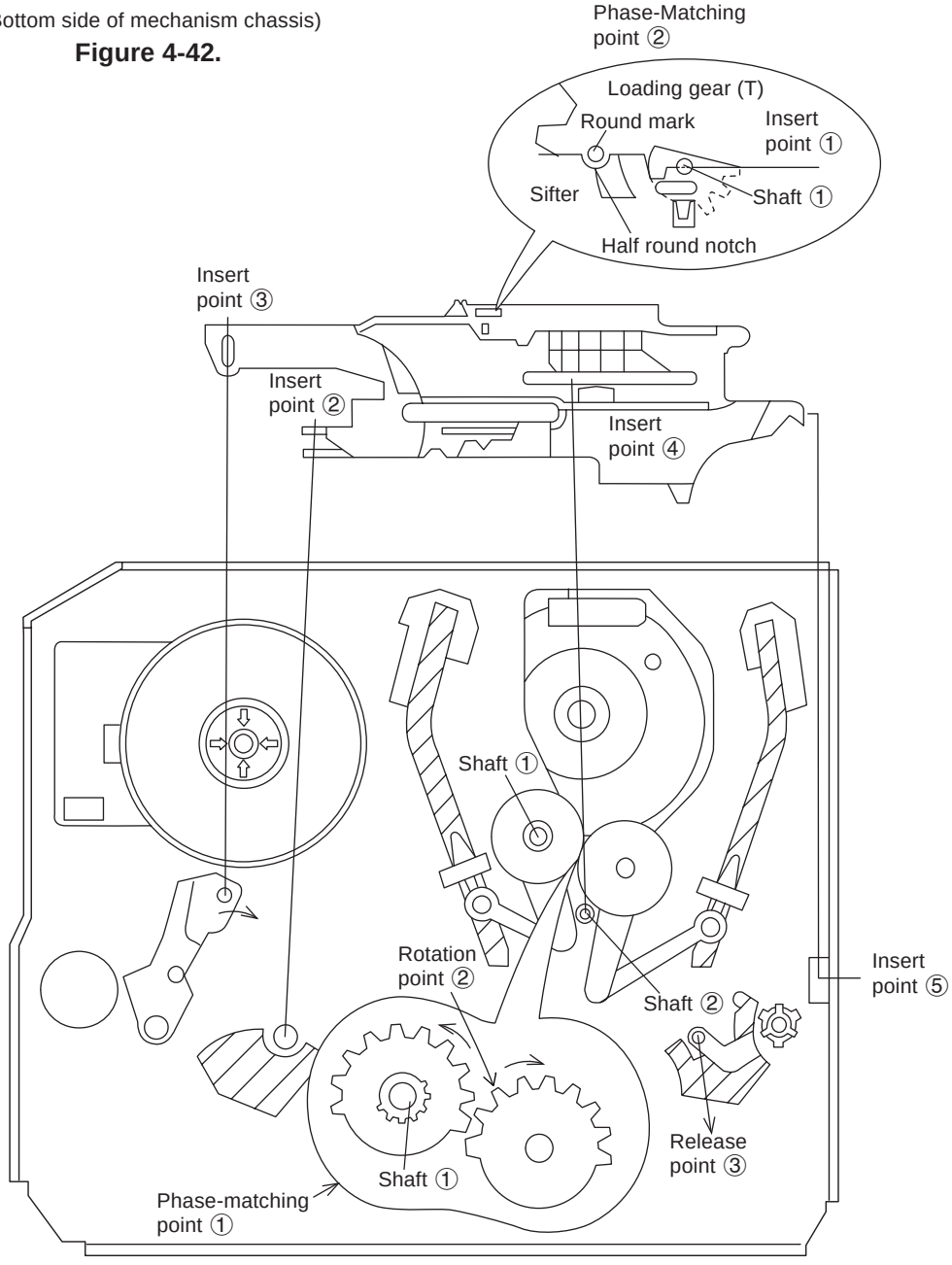


Figure 4-43.

INSTALLING THE MASTER CAM (AT REAR SIDE OF MECHANISM CHASSIS)

1. Make sure beforehand that the shifter is at the point as shown below.
2. Place the master cam in the position as shown below.

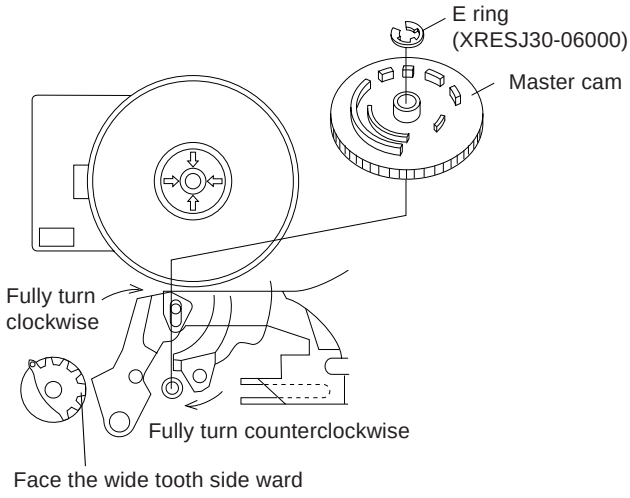


Figure 4-44-1.

Note:
See the figure below for the phase matching between the master cam and the casecon drive gear.

3. Finally fix with the E ring.

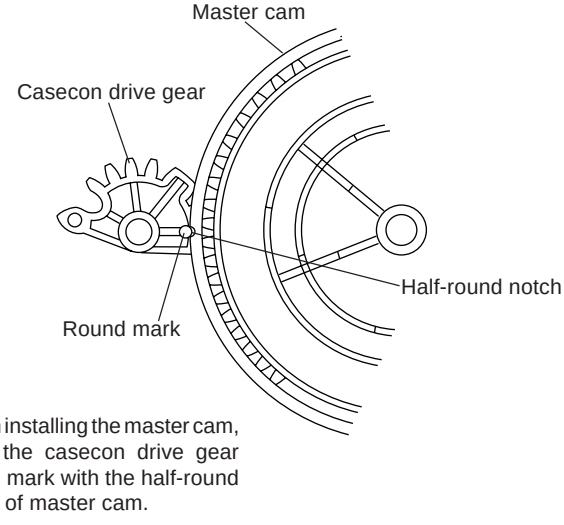


Figure 4-44-2.

REPLACEMENT OF LOADING MOTOR

- **Removal**

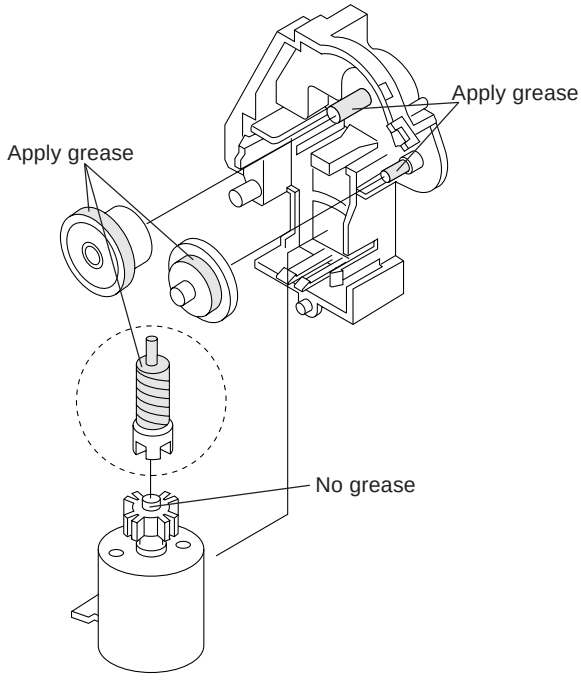


Figure 4-45.

- **Replacement**

Remove the loading motor, and install the replacement loading motor as shown below.

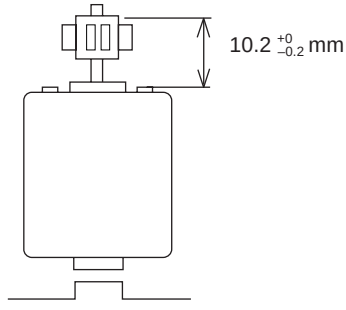


Figure 4-46.

The loading motor pressing-in must be less than 147 N (15 kgf).
Adjust the distance between motor and pulley to 10.2 $^{+0}_{-0.2}$ mm).

ASSEMBLY OF CASSETTE HOUSING

1. Drive Gear and R Drive angle ass'y

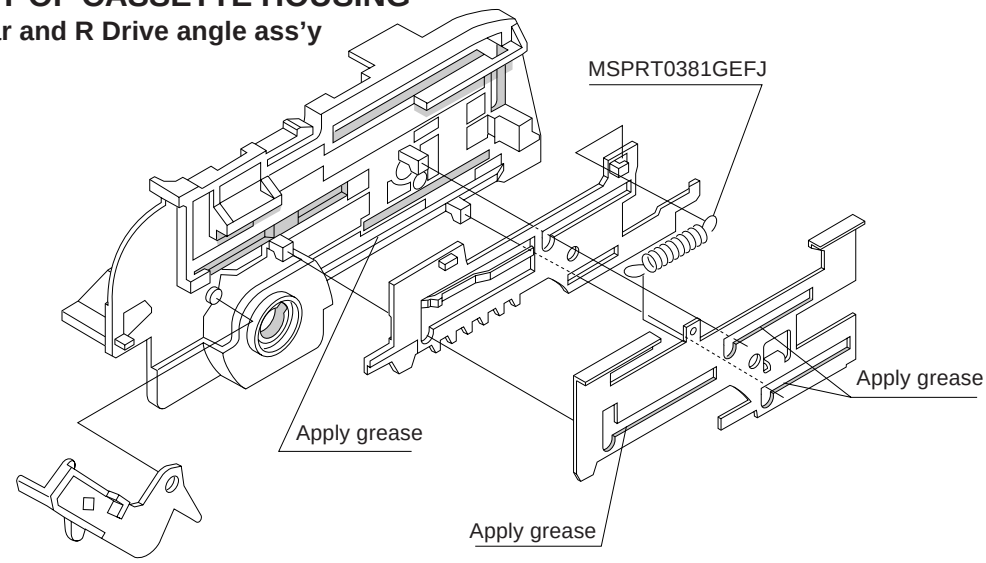
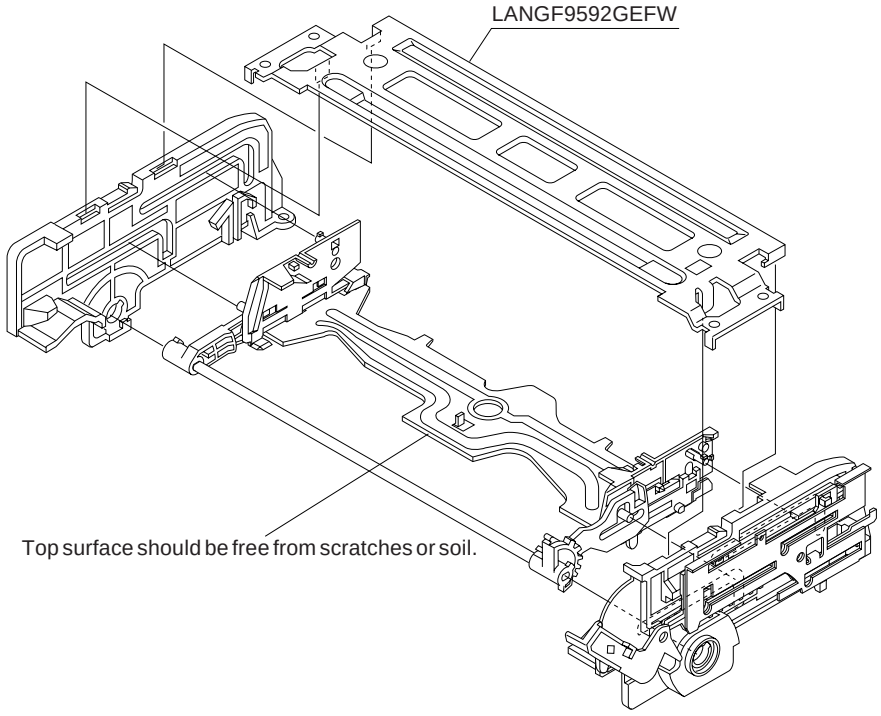


Figure 4-47.

2. Synchro Gear, Drive Gear L and Drive Gear R



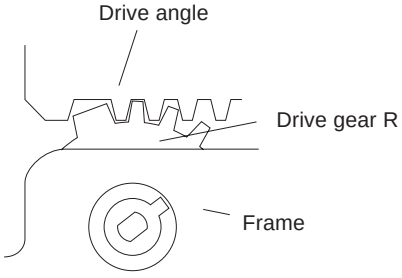


Figure 4-48.

5. ELECTRICAL ADJUSTMENT

Notes:

- Before the adjustment:
  Electrical adjustments discussed here are often required after replacement of electronic components and mechanical parts such as video heads.
  Check that the mechanism and all electric components are in good working condition prior to the adjustments, otherwise adjustments can not be completed.

- Instruments required:
  ◎Colour TV monitor
  ◎Dual-trace oscilloscope
  ◎ Alignment tape (VROCPSV), (VROATSV)
  ◎Blank video cassette tape
  ◎DC voltmeter
  ◎Screwdriver for adjustment

※Servicing precautions
When the IC710 (E^2PROM) has been replaced, make the following reprogramming. Depending on models, the IC710 (E^2PROM) has been factory-adjusted for it's memory function.
It's therefore necessary to reprogram the memory function for the model in question.
Note that the servo circuit requires readjustments for the head switching point, slow and still modes.

- **Location of controls and test points**

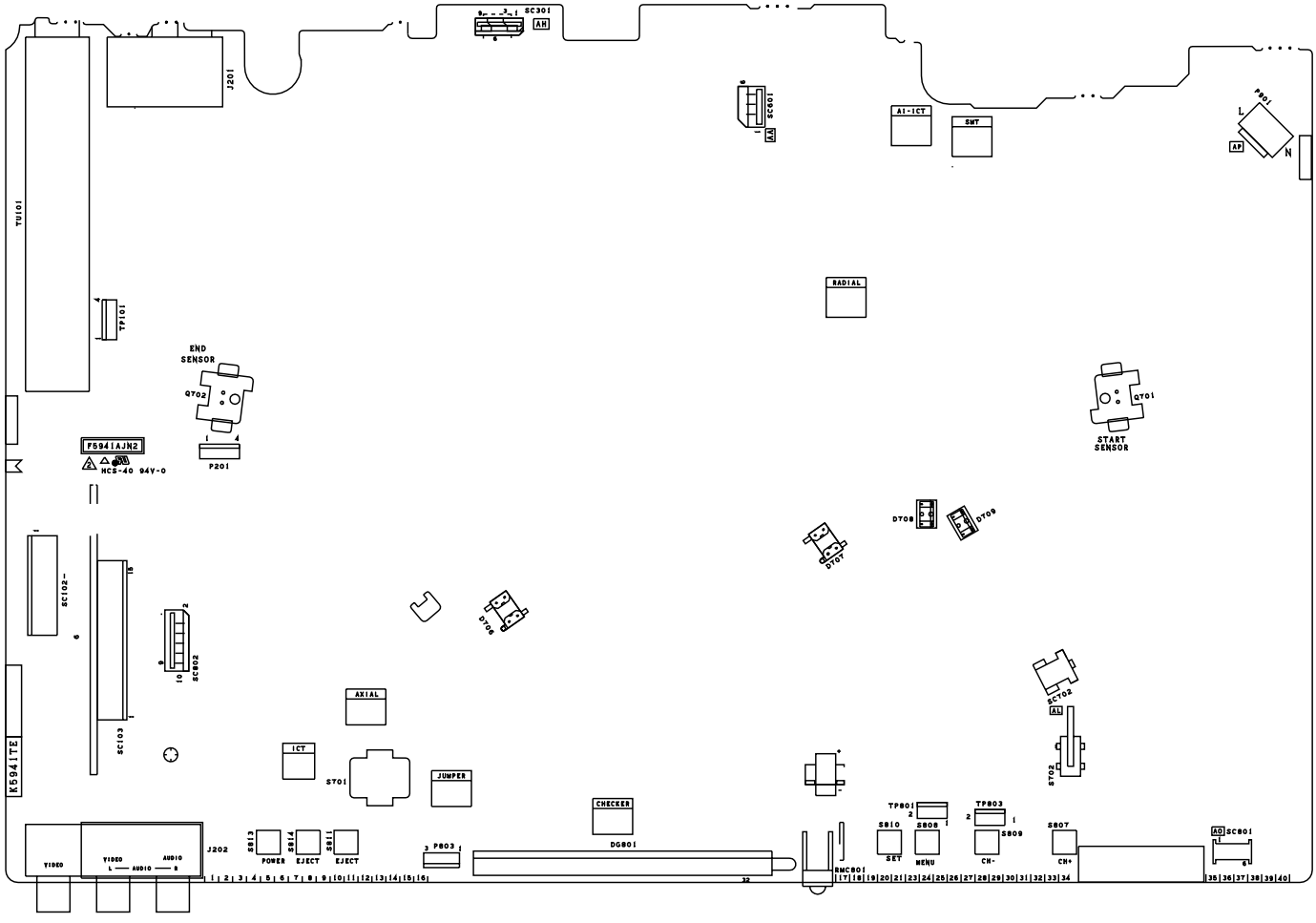


Figure 5-1.

SERVO CIRCUIT ADJUSTMENT

ADJUSTMENT OF HEAD SWITCHING POINT

Measuring instrument	Dual-trace oscilloscope Colour TV monitor
Mode	Playback
Cassette	Alignment tape (VROCPSV)
Test point	Pin(2) of P201 (H.SW.P.) to CH-1, VIDEO OUT jack to CH-2 (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side.)
Specification	6.5 ± 0.5H (lines)

1. Remove the front panel and play the alignment tape. (VROCPSV)
2. Get TP801 short circuited or press "TEST" key (47H) at universal remote control to call the Test Mode. (Digitron will blinking as tracking goes to center)
3. Press "PLAY".
   Auto PG Mode will be ON and playback mark " ▶ " blinking.
4. Press "STOP".
   " ▶ " blinking stops and auto adjustment finished.
5. Check that V-Sync is 6.5 ± 0.5H and the waveform is as shown in Figure 5-2.

Note:

For manual PG adjustment, press FF or REW at the Test Mode to set the tracking in center.

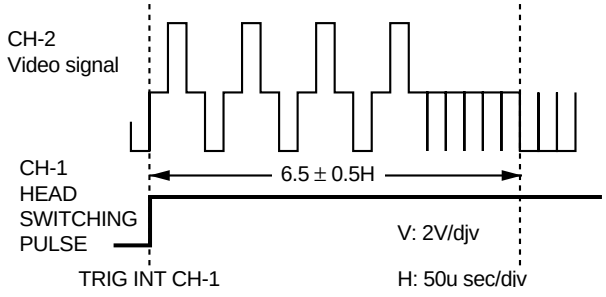


Figure 5-2.

ADJUSTMENT OF PAL SYSTEM SP/LP SLOW TRACKING PRESET

Measuring instrument	Colour TV monitor
Mode	Playback
Cassette	Self-recorded tape (SP/LP mode)(See Note below)
Control	Tracking control buttons (▲) or (▼)
Specification	Minimized noise on monitor screen

1. Have the unit to receive a good TV broadcast or feed a video signal to the VIDEO IN jack. (See note ② below)
2. Set the tape speed in SP mode by using the remote control and record the signal on tape.
3. Rewind and play the tape where signal was recorded in above step.
4. Press the SLOW button on the remote control, and playback the recorded portion in the slow mode.
5. Make for a moment short-cirucuit TP801.
   Be sure that all the fluorescent display tubes light up into the TEST mode.
6. Look at the monitor screen and adjust the (▲) or (▼) TRACKING buttons so that the there is noise disappears from the screen.
7. Press the STOP button to return to normal mode.
8. Play the tape a few seconds then press the SLOW button again and make sure there is no noise in the screen.(For the LP mode put adjustment at the same adjustmet way as SP mode.)

Notes:

① Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.
② The TV program will not be recoded if RCA or 21pin plugs are pluged in the AUDIO/VIDEO input terminals.
③ The tracking control is enabled with the (▲)/(▼) button.

ADJUSTMENT OF PAL SYSTEM FV (False Vertical Sync) OF STILL PICTURE

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Self-recorded tape (SP mode) (See Note below ①)
Control	Tracking control buttons (▲) or (▼)
Specification	No vertical jitter of picture

1. Play a cassette which was recorded by the unit in SP mode.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust (▲) or (▼) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape in SP mode and make sure vertical jitter of the picture is not noticeable.(For the LP mode put adjustment at the same adjustment way as SP mode.)

Note:

① Self-recorded tape is a cassette whose program was recorded by the unit being adjusted.
② The tracking control is enabled with the (▲)/(▼) button.

ADJUSTMENT OF NTSC SYSTEM SP/EP SLOW TRACKING PRESET

Measuring instrument	Colour TV monitor
Mode	Playback
Cassette	Self-recorded tape (SP/EP mode)(See Note below)
Control	Tracking control buttons (▲) or (▼)
Specification	Minimized noise on monitor screen

1. Have the unit to receive a good TV broadcast or feed a video signal to the VIDEO IN jack. (See note ② below)
2. Set the tape speed in SP mode by using the remote control and record the signal on tape.
3. Rewind and play the tape where signal was recorded in above step.
4. Press the SLOW button on the remote control, and playback the recorded portion in the slow mode.
5. Make for a moment short-ciucuit TP801.
   Be sure that all the fluorescent display tubes light up into the TEST mode.
6. Look at the monitor screen and adjust the (▲) or (▼) TRACKING buttons so that the there is no noise disappears from the screen.
7. Press the STOP button to return to normal mode.
8. Play the tape a few seconds then press the SLOW button again and make sure there is no noise in the screen.(For the E P mode put adjustment at the same adjustmet way as SP mode.)

Notes:

① Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.
② The TV program will not be recoded if RCA or 21pin plugs are pluged in the AUDIO/VIDEO input terminals.
③ The tracking control is enabled with the (▲)/(▼) button.

ADJUSTMENT OF NTSC SYSTEM FV (False Vertical Sync) OF STILL PICTURE

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Self-recorded tape (SP mode) (See Note below ①)
Control	Tracking control buttons (▲) or (▼)
Specification	No vertical jitter of picture

1. Play a cassette which was recorded by the unit in SP mode.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust (▲) or (▼) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape in SP mode and make sure vertical jitter of the picture is not noticeable.(For the EP mode put adjustment at the same adjustment way as SP mode.)

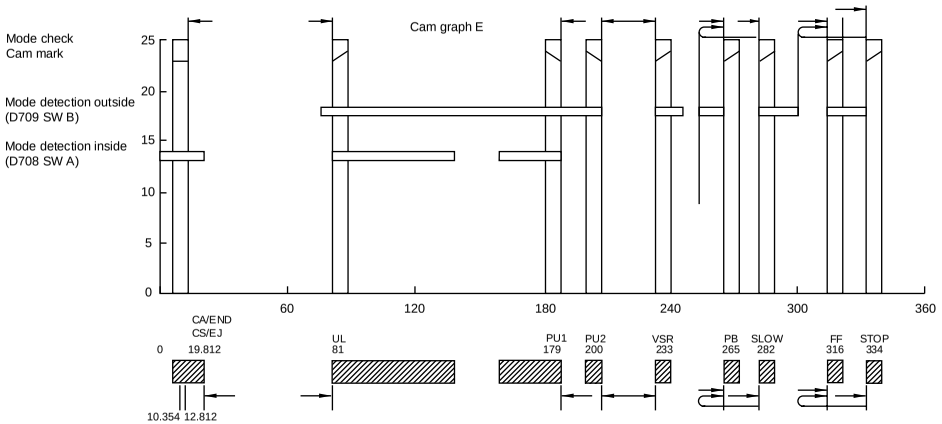
Note:

① Self-recorded tape is a cassette whose program was recorded by the unit being adjusted.
② The tracking control is enabled with the (▲)/(▼) button.

6. MECHANISM OPERATION FLOWCHART AND TROUBLESHOOTING GUIDE

MECHANISM OPERATION FLOWCHART

G mechanical timing

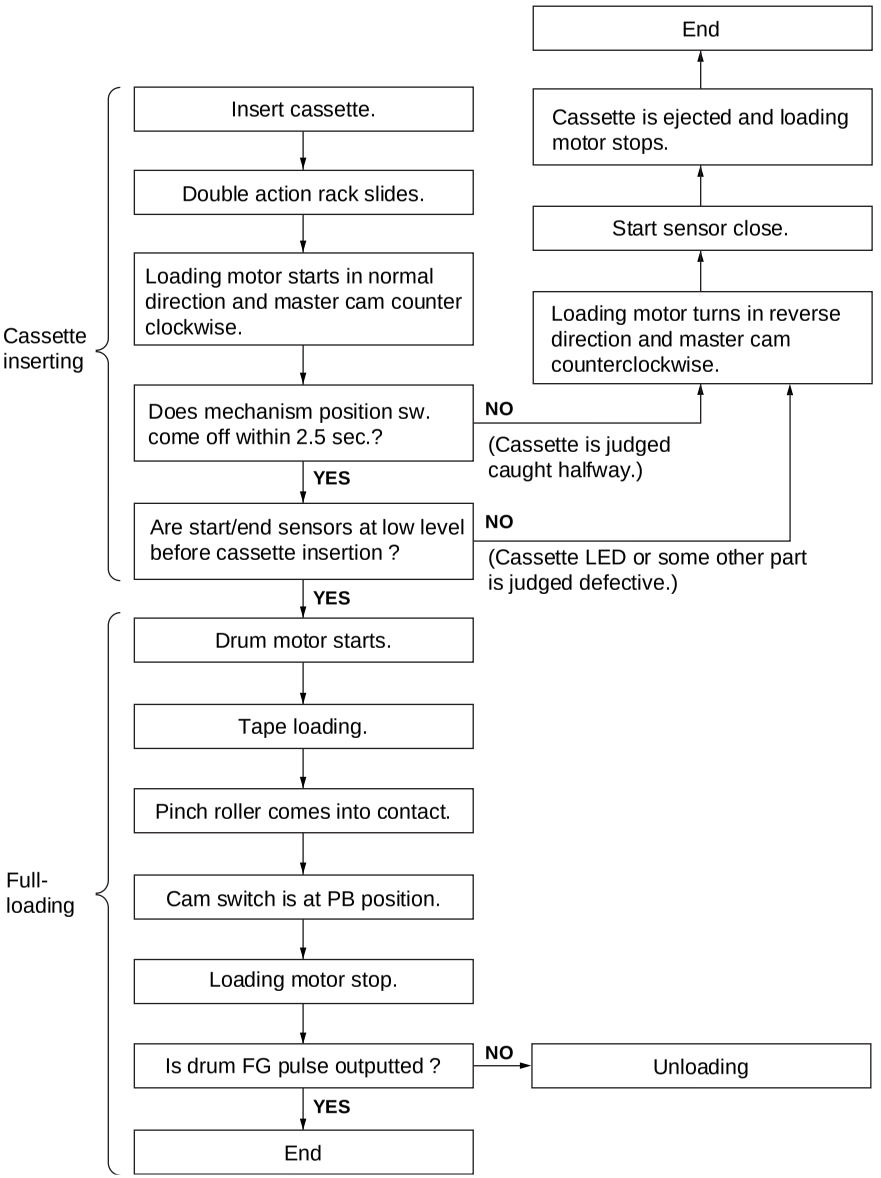


	EJ					UL				PU		PU2		VSR				PB		SLW			FF		STP
Mode detection outside	0	0		0	0	0	1	1	1		1	1	1	1	0		1	1	0	1	0	0	1	1		0	1	1	0
Mode detection inside	1	1		0	0	0	0	1	1		0		1	1	0	0	0		0	0	0	0	0	0		0	0	0	0
S sensor	1	1			0	1	1 or 0																						

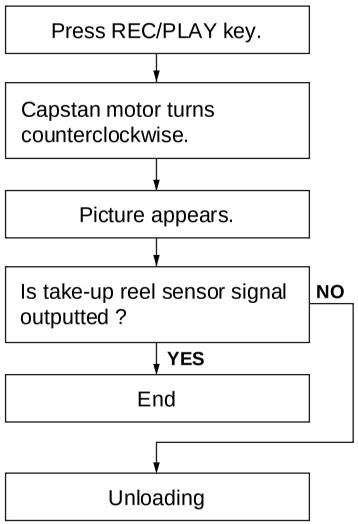
S sensor Open / Close

	Mode detection inside sensor A	Mode detection outside sensor B
CS/EJ	1	0
ULD	1	1
PU1	1	1
PU2	0	1
VSR	0	1
PB	0	0
SLOW	0	1
FF	0	1
STOP	0	0

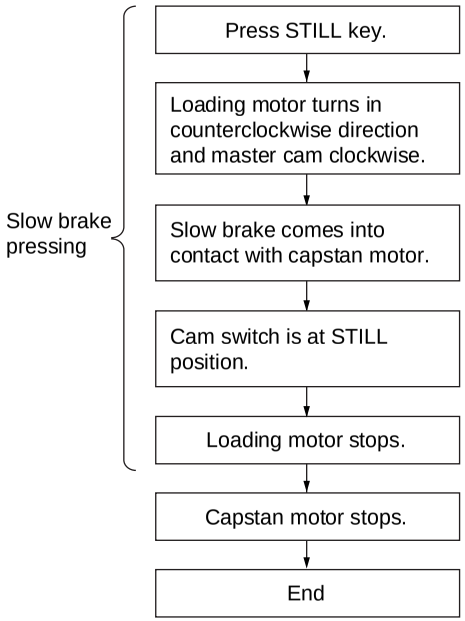
CASSETTE INSERTION → STOP



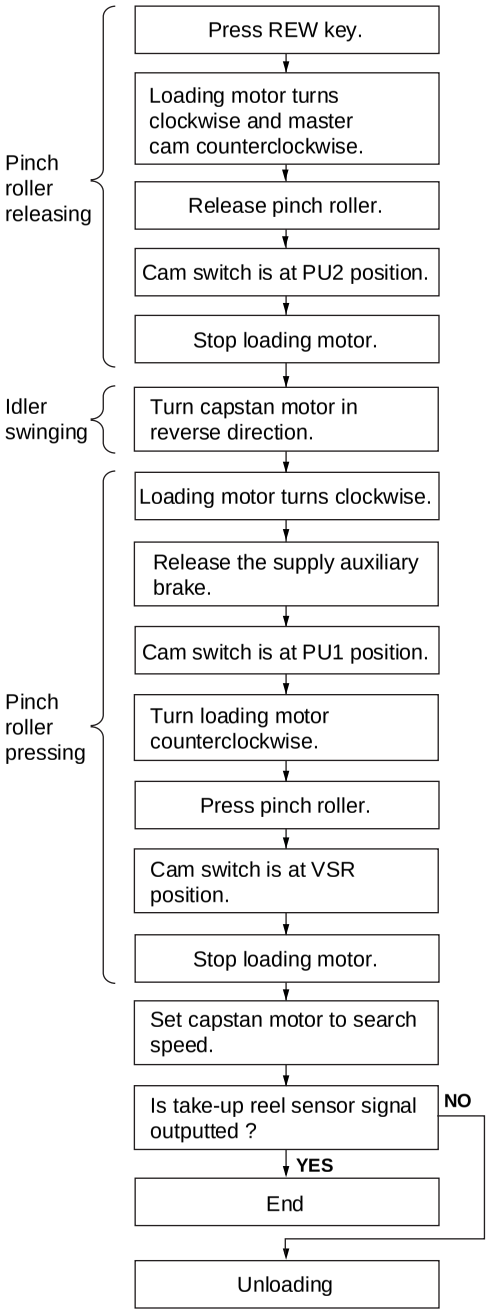
STOP → REC/PLAY



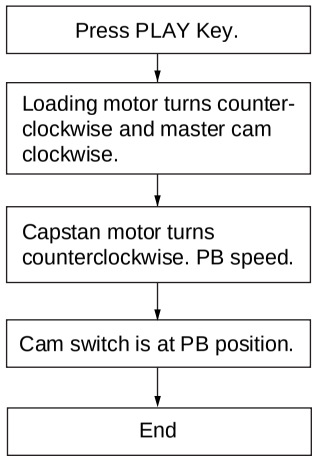
PLAY → STILL



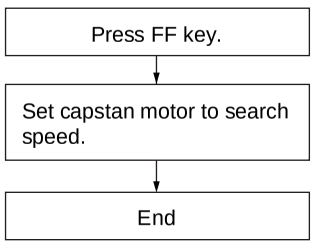
PLAY → VSR



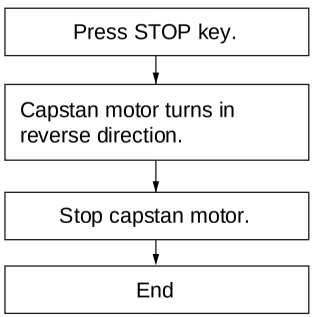
VSR → PLAY



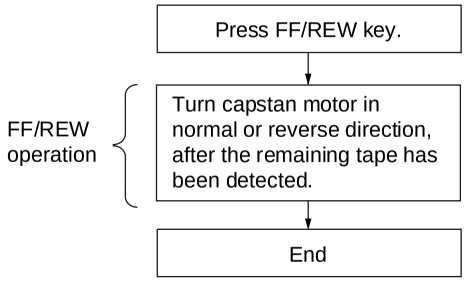
PLAY → VSF



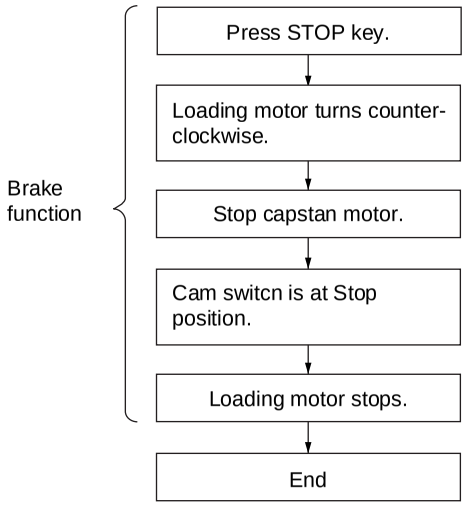
REC/PLAY → STOP



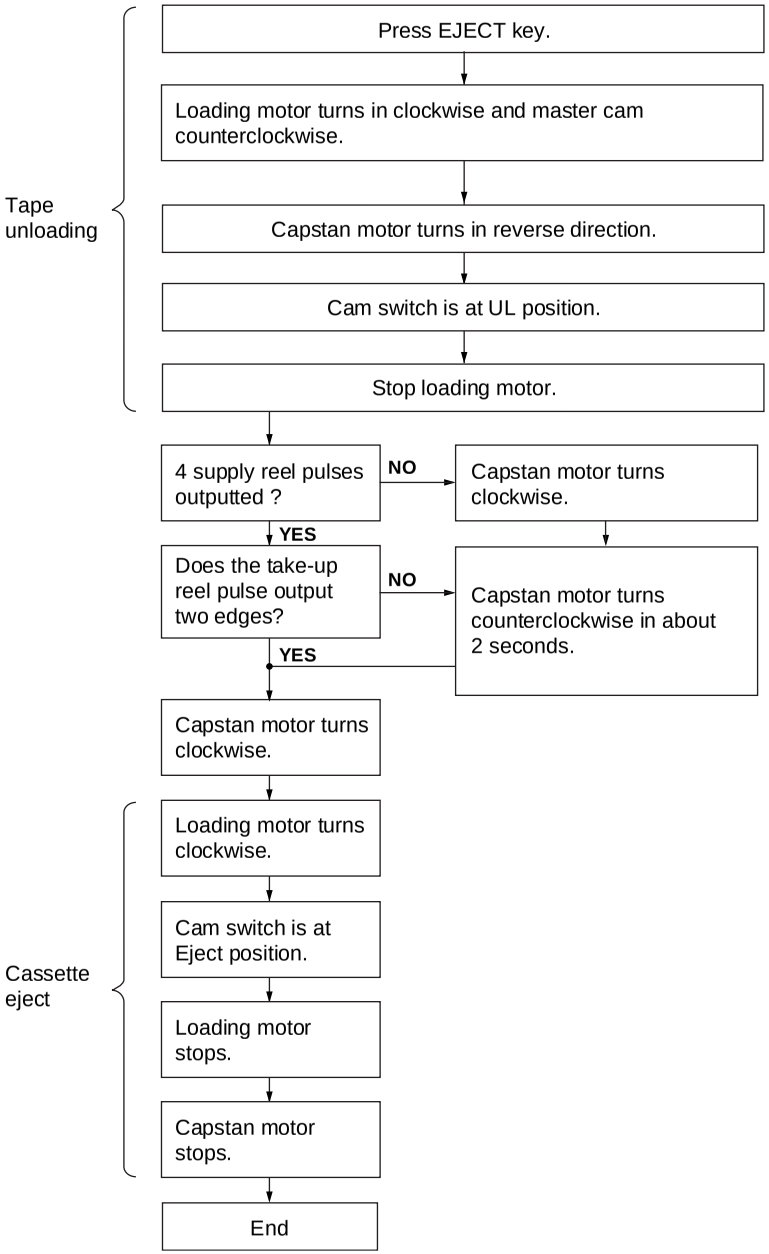
STOP → FF/REW



FF/REW → STOP

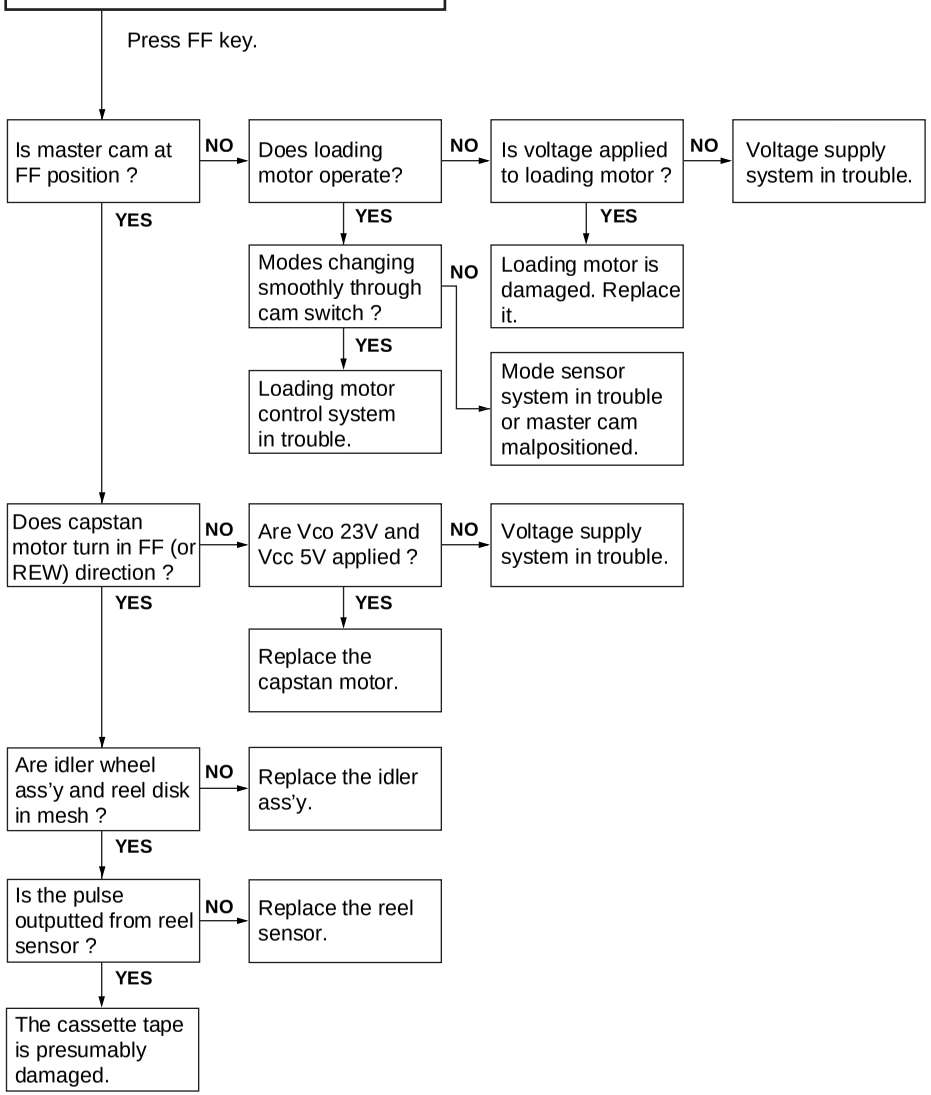


STOP → CASSETTE EJECT

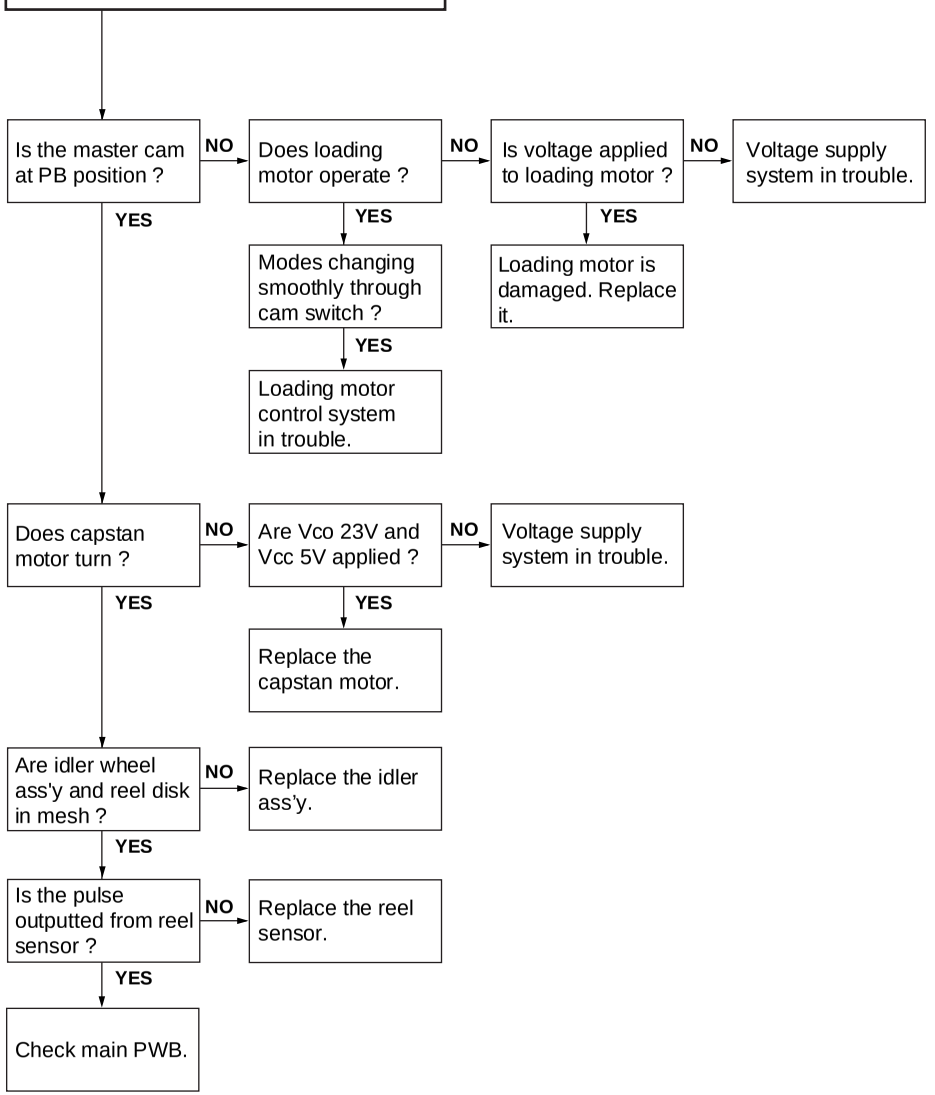


MECHANISM TROUBLESHOOTING

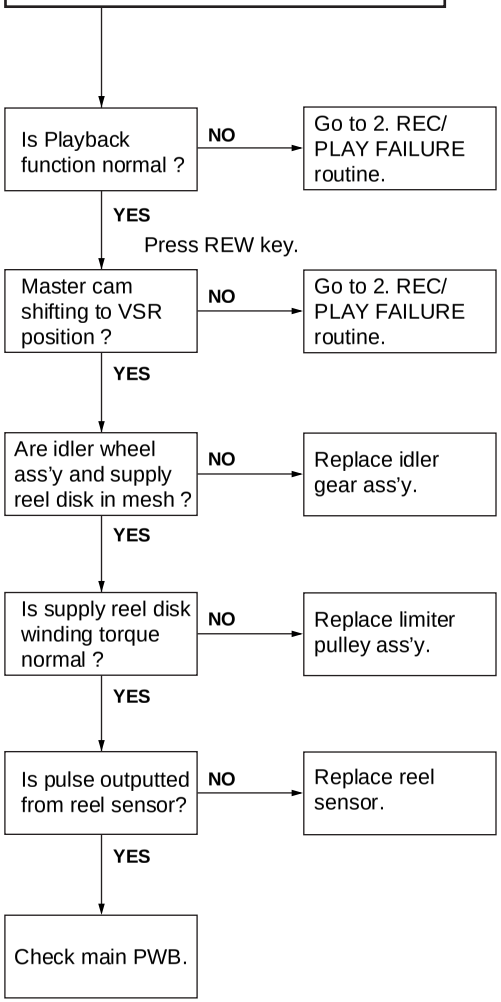
1. FF/REW FAILURE (NO TAPE WINDING)



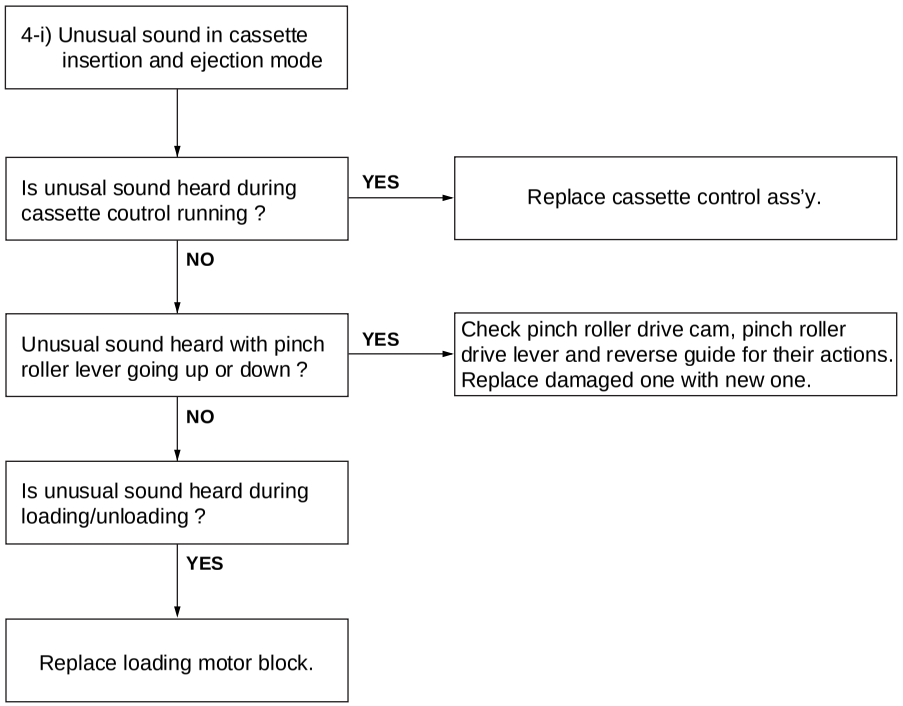
2. REC/PLAY FAILURE (MODE RELEASE)

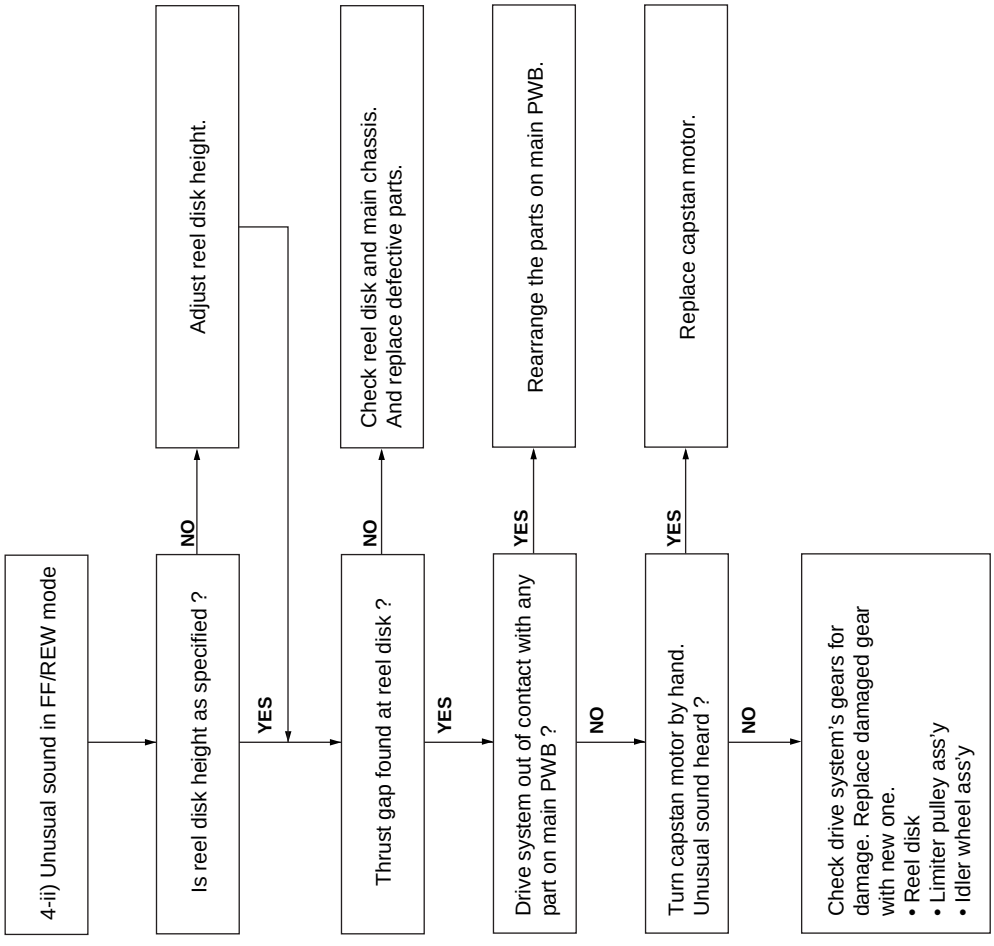


3. WINDING FAILURE AT VSR



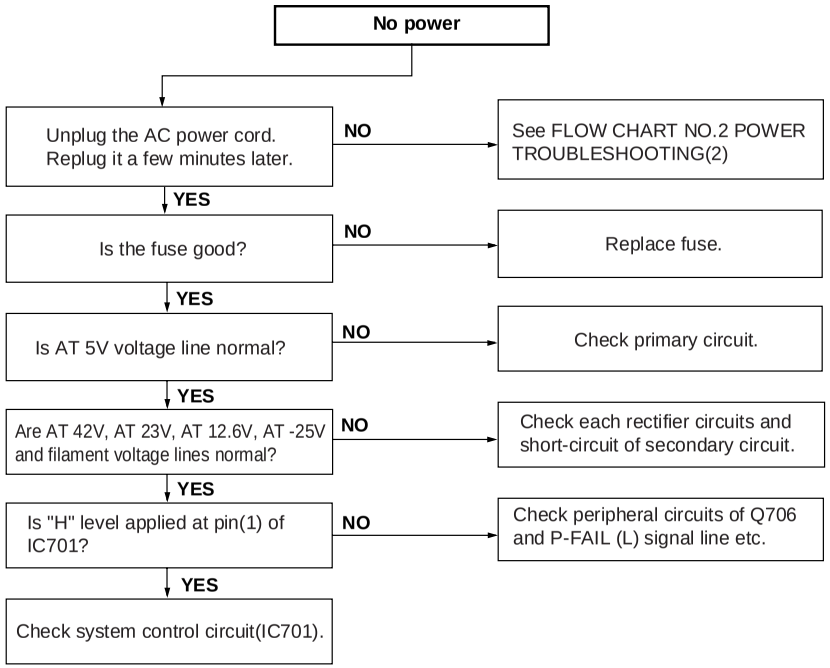
4. UNUSUAL SOUND IN EACH MODE



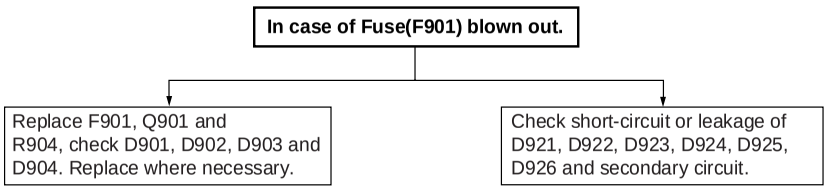

4-ii) Unusual sound in FF/REW mode
Is reel disk height as specified ?
NO
Adjust reel disk height.
YES
Thrust gap found at reel disk ?
NO
Check reel disk and main chassis.
And replace defective parts.
YES
Drive system out of contact with any part on main PWB ?
YES
Rearrange the parts on main PWB.
NO
Turn capstan motor by hand.
Unusual sound heard ?
YES
Replace capstan motor.
NO
Check drive system's gears for damage. Replace damaged gear with new one.
• Reel disk
• Limiter pulley ass'y
• Idler wheel ass'y

7. TROUBLESHOOTING

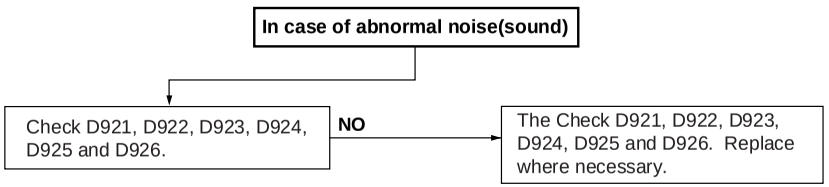
FLOW CHART NO.1 POWER TROUBLESHOOTING(1)



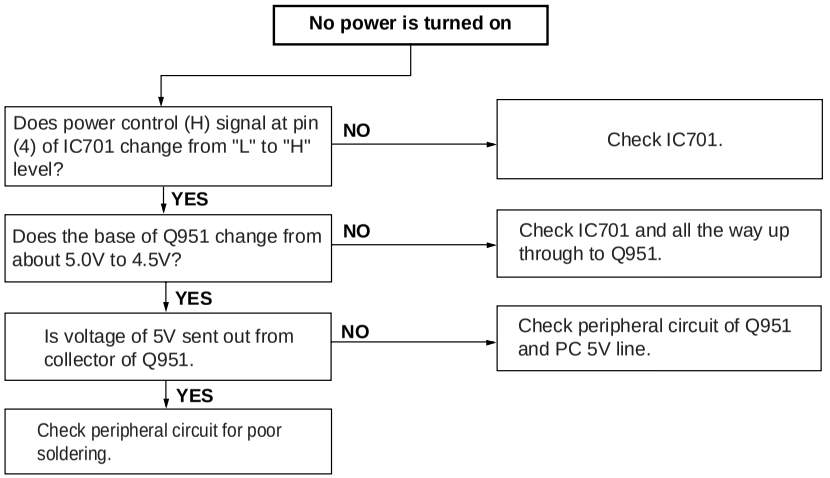
FLOW CHART NO.2 POWER TROUBLESHOOTING(2)



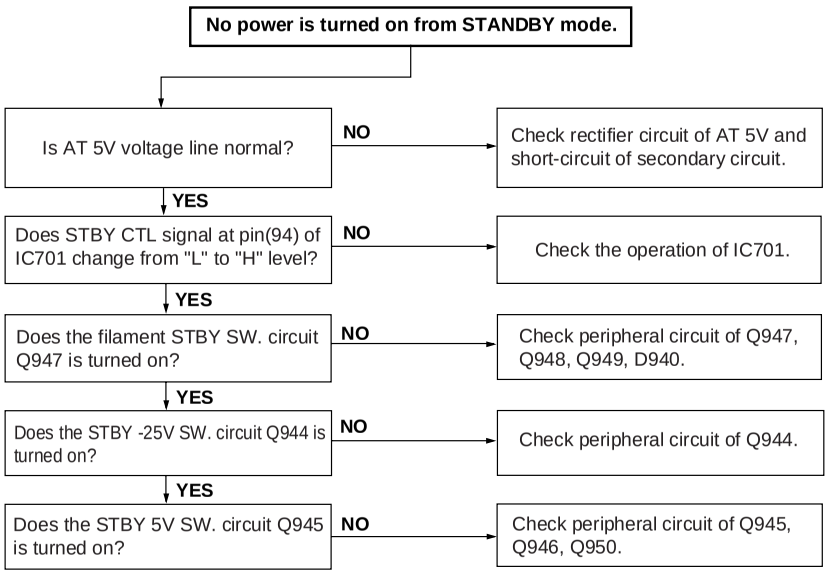
FLOW CHART NO.3 POWER TROUBLESHOOTING(3)



FLOW CHART NO.4 POWER TROUBLESHOOTING(4)



FLOW CHART NO.5 POWER TROUBLESHOOTING(5)



FLOW CHART NO.6 POWER TROUBLESHOOTING(6)

In case of output voltage at low level.

Check peripheral circuits IC902, IC921, C933, R932, R929, R930 and R931. **NO** → The IC901, C913, R908, R909, R910 and R911 as a result of check, if poor replace.

YES

Check IC902 and peripheral circuits pin(9) of IC901. **NO** → Replace IC901.

YES

Check short-circuit or leak of T901. **NO** → Replace T901.

YES

Check primary circuit and peripheral circuit of Q901.

FLOW CHART NO.7 TIMER TROUBLESHOOTING

The flourescent display tube fails light up.

Is the supply voltage of 5V fed to pin(8) of IC801? **NO** → Check STBY 5V line.

YES

Is the supply negative voltage of -25V fed to pin(1) of IC801? **NO** → Check negative voltage line(STBY -25V) and power circuit.

YES

Is the filament voltage applied between (1)/(2) and (31)/(32) of the fluorescent display tube? Also negative voltage applied between these pins and GND. **NO** → Check power circuit and peripheral circuit of D952.

YES

Does the fluorescent display tube function? **NO** → Check for cracks on the fluorescent display tube.

YES

Replace IC801.

FLOW CHART NO.8 KEY CONTROL TROUBLESHOOTING(1)

Key-in input is not received <For jog shuttle mode.>

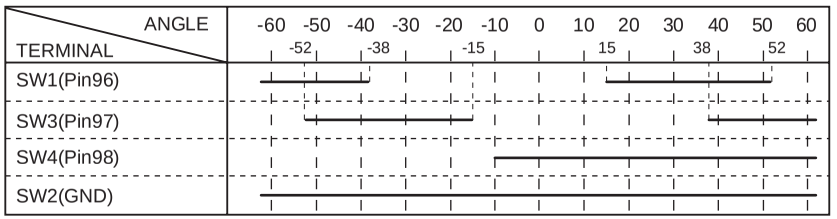
Does the key switch make good contact, when the cassette tape is inserted? **NO** → Check switch contact.

YES

Is there the function control voltage inputted at pins (96),(97) and (98) of IC701, when the jog shuttle ring are activated? **NO** → Check peripheral circuit of pins(96), (97) and (98) of IC701, and the jog shuttle ring.

YES

Replace IC701.



FLOW CHART NO.9 KEY CONTROL TROUBLESHOOTING(2)

Key-in input is not received <Except for jog shuttle mode.>

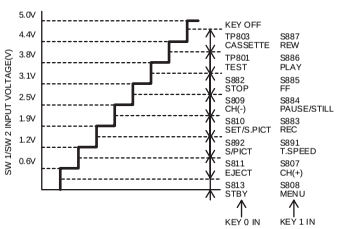
Does the key switch make good contact, when the cassette tape is inserted? **NO** → Check switch contact.

YES

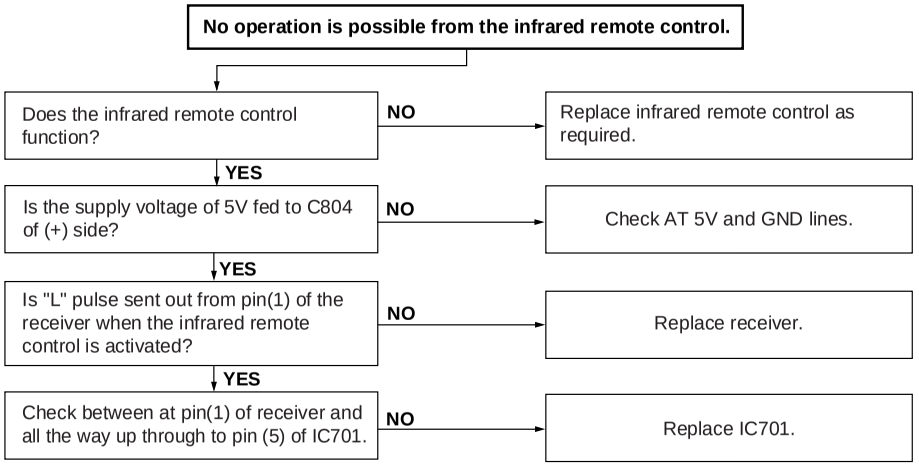
Is there the function control voltage inputted at the pins(87) and (88) of IC701, when the keys are activated? **NO** → Check peripheral circuit of pins(87) and (88) of IC701, and the function keys.

YES

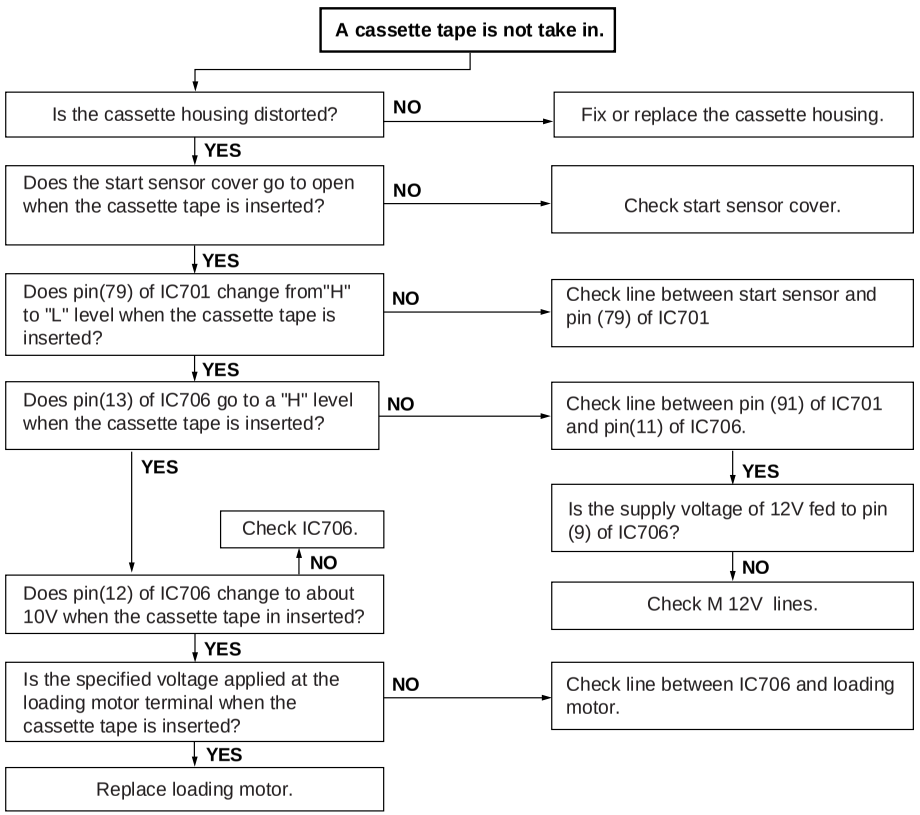
Replace IC701.



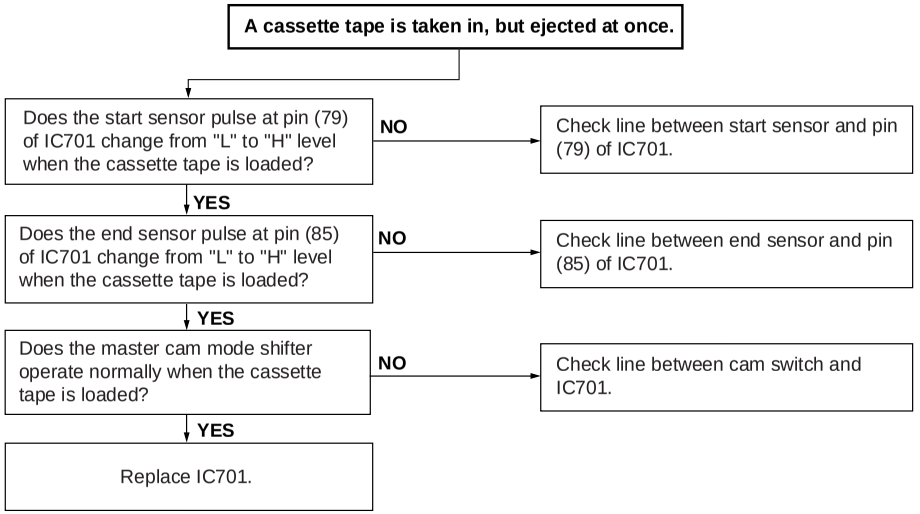
FLOW CHART NO.10 INFRARED R/C TROUBLESHOOTING



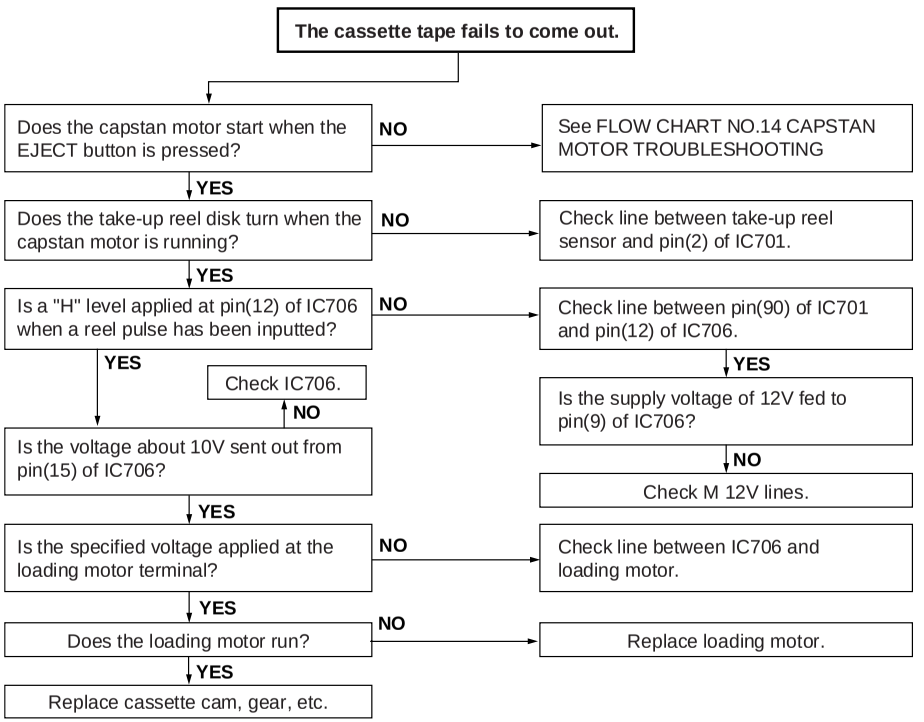
FLOW CHART NO.11 CASSETTE CONTROL TROUBLESHOOTING(1)



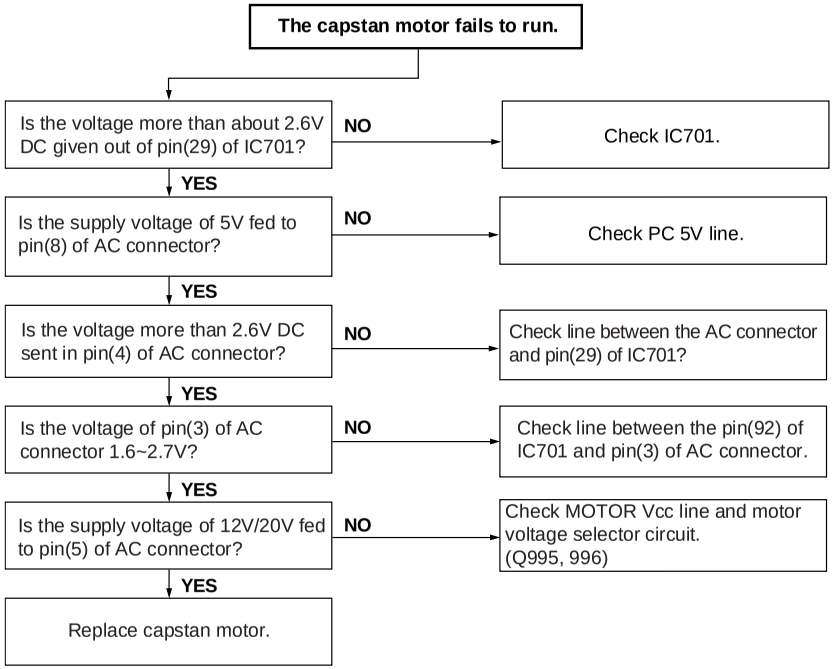
FLOW CHART NO.12 CASSETTE CONTROL TROUBLESHOOTING(2)



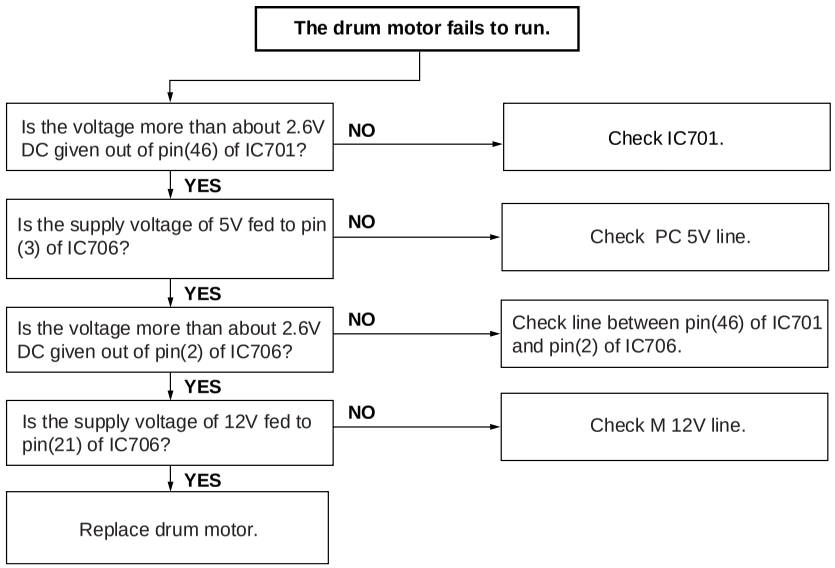
FLOW CHART NO.13 LOADING MOTOR AND EJECT TROUBLESHOOTING



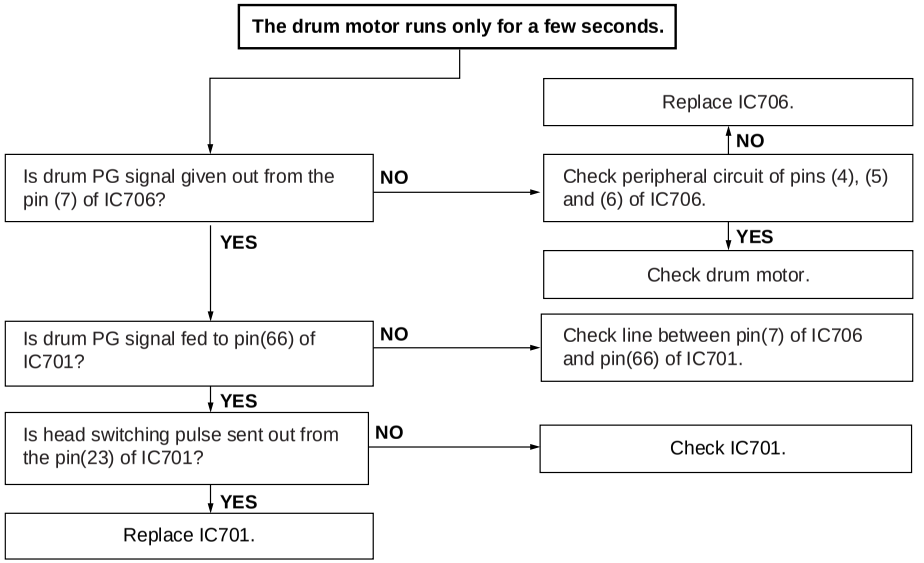
FLOW CHART NO.14 CAPSTAN MOTOR TROUBLESHOOTING



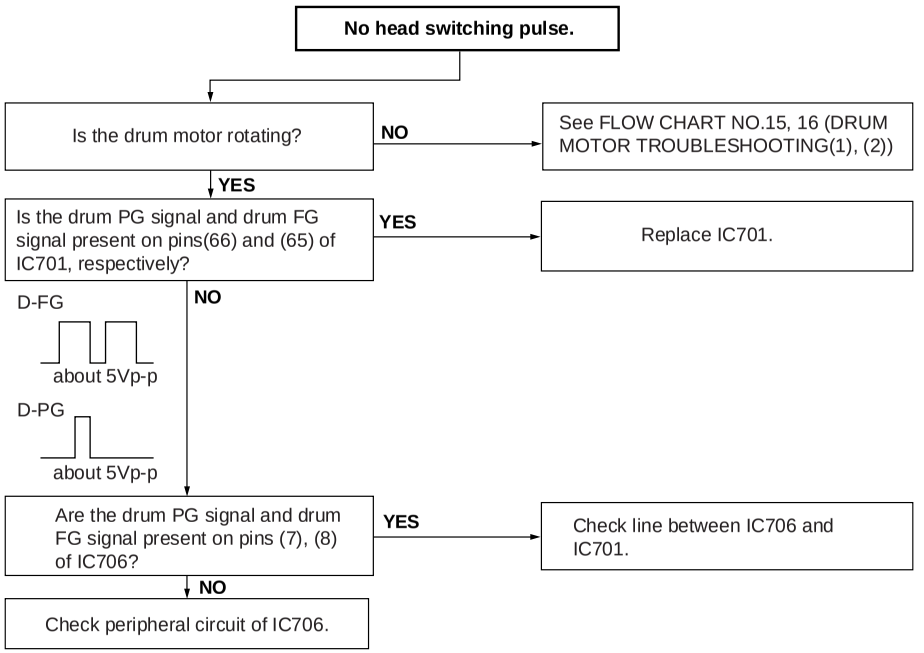
FLOW CHART NO.15 DRUM MOTOR TROUBLESHOOTING(1)



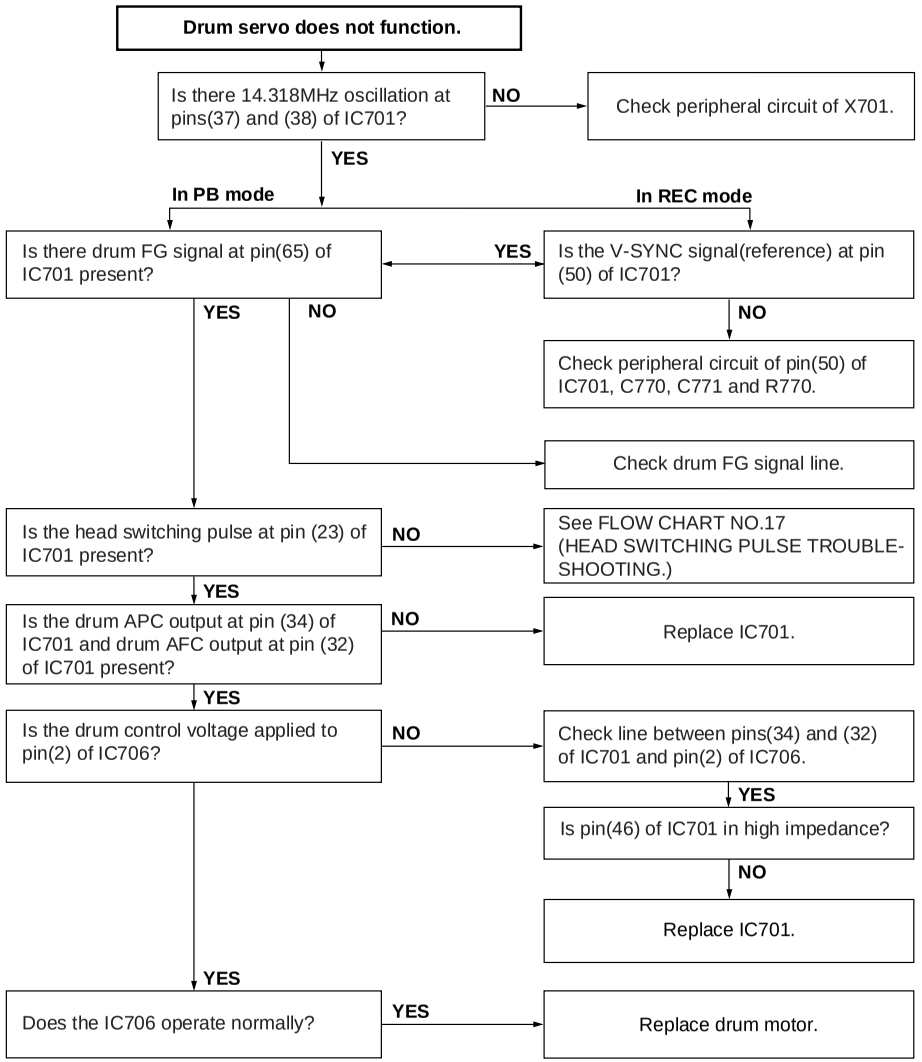
FLOW CHART NO.16 DRUM MOTOR TROUBLESHOOTING(2)



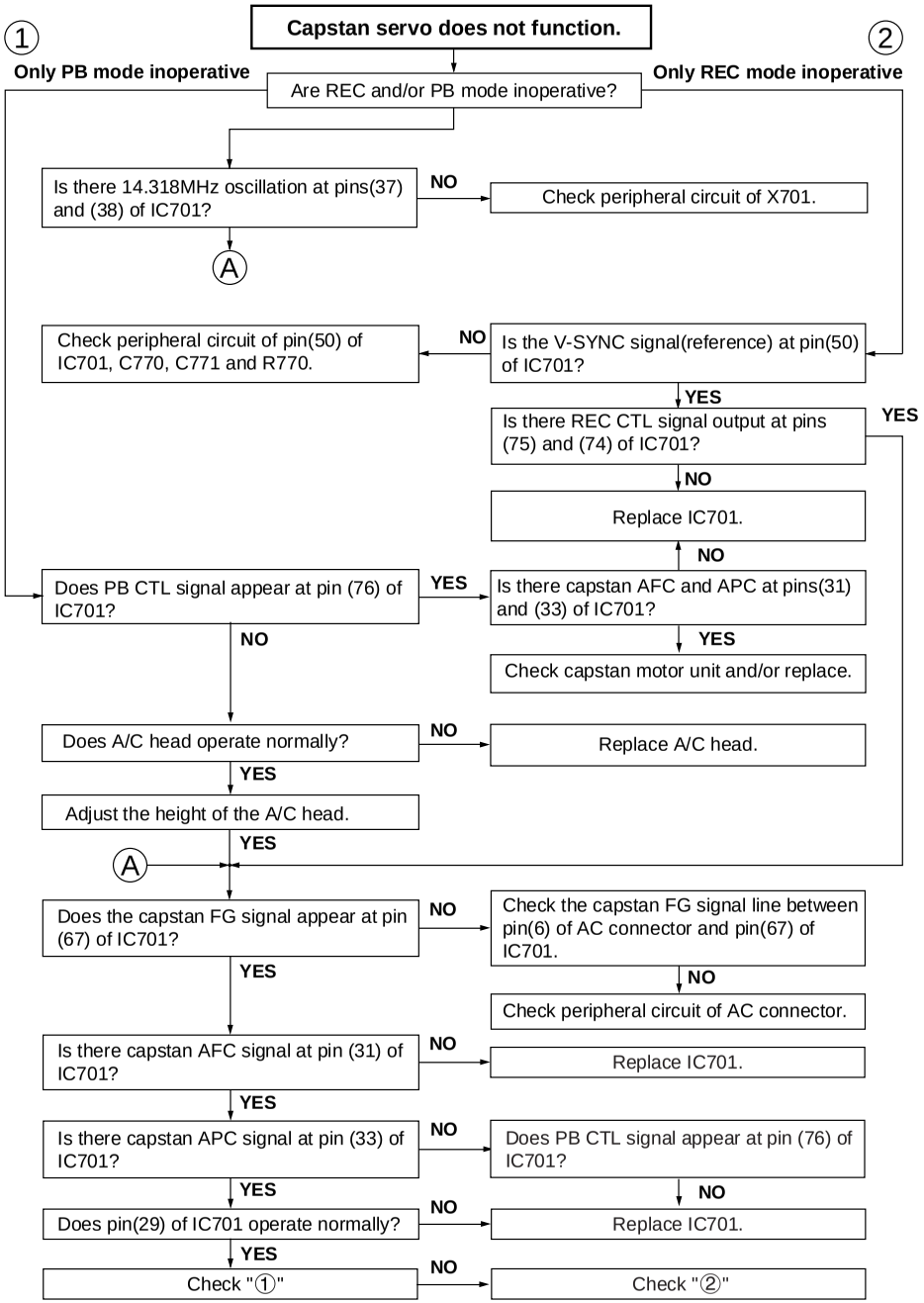
FLOW CHART NO.17 HEAD SWITCHING PULSE TROUBLESHOOTING.



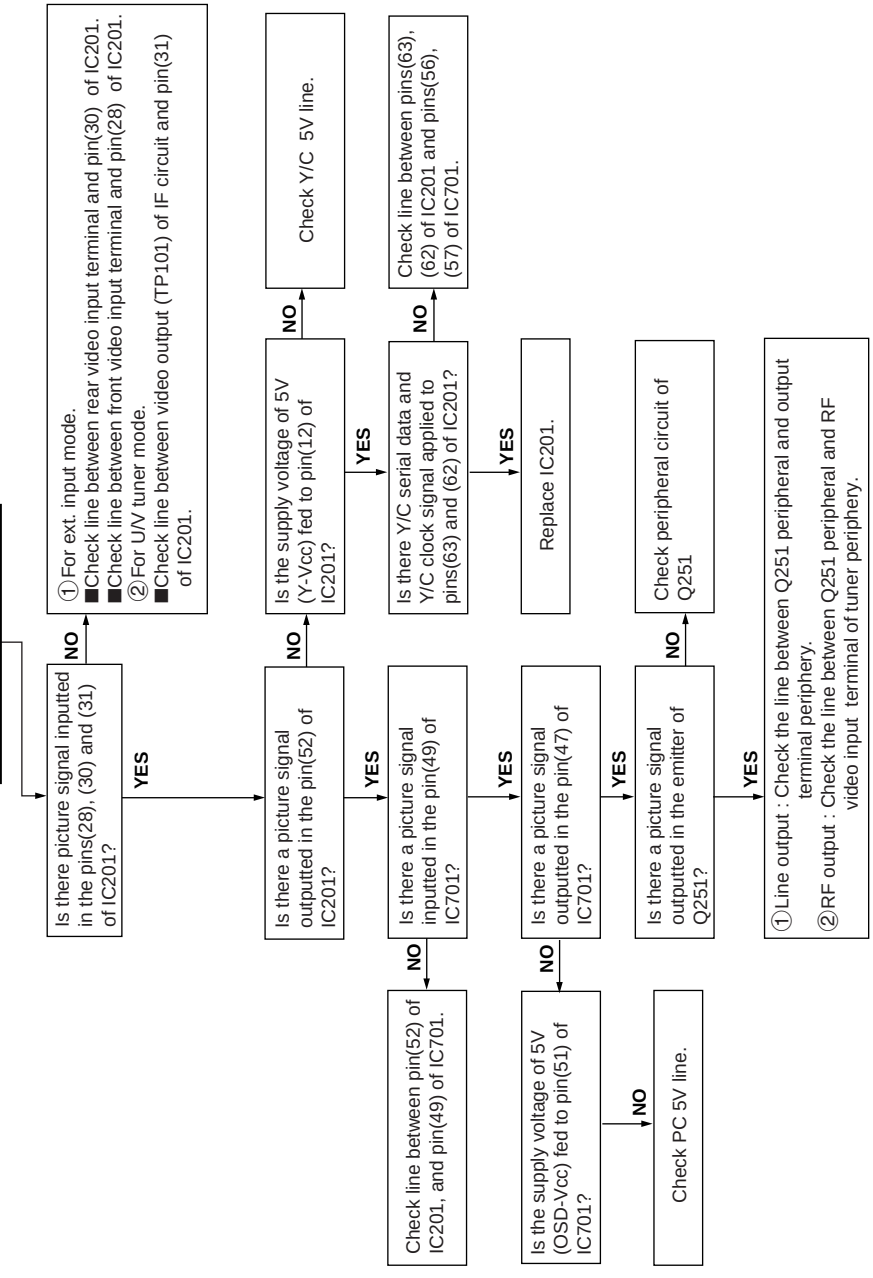
FLOW CHART NO.18 DRUM SERVO TROUBLESHOOTING



FLOW CHART NO.19 CAPSTAN SERVO TROUBLESHOOTING



FLOW CHART NO.20 E-E MODE TROUBLESHOOTING



FLOW CHART NO.21 RECORDING MODE TROUBLESHOOTING

Picture (Luminance) record is impossible (E-E mode is possible).

Is there luminance signal (approx. 0.5Vp-p) input in the pin (19) of IC201?
- NO → Check line between pins (18) and (19) of IC 201.
- YES ↓

Is there luminance signal (approx. 0.3Vp-p) input in the pin (42) of IC201?
- NO → Check line between pins (21) and (42) of IC201 (C208).
- YES ↓

Is there luminance signal (approx. 0.5Vp-p) input in the pin (26) of IC201?
- NO → Check line between pins (39) and (26) of IC201 (C212).
  - YES ↓
  - Is there luminance signal (aprox. 0.5Vp-p) input in the pin (39) of IC201?
  - NO ↓
  - Is voltage 5V applied to the CCD section power terminal at pin (36) of IC201?
  - YES ↓
  - Is CCD control voltage approx. 5V applied normally to the pin (37) from pin (57) of IC201? Is clock signal (approx. 8.86MHz<PAL mode> or 7.16MHz<NTSC mode>/0.5Vp-p) for CCD applied normally to the pin (44) from (69) of IC201?
- YES ↓

Is there luminance signal (approx. 0.5Vp-p) input in the pin (23) of IC201?
- NO → Check line between pins (24) and (23) of IC201 (C210).
- YES ↓

Is there luminance signal (approx. 0.5Vp-p) input and output in the pins (13) and (14) of IC201, respectively?
- NO → Check peripheral circuit of pins (13) and (14) of IC201 (R201,R202, C203).
- YES ↓

SP mode: Is there record FM signal (approx. 20mVp-p) output at pins (88), (89) <<SP1>> and pins (86), (87) <<SP2>>of IC201?	SP mode: Is there chroma ingredient included signal (approx. 20mVp-p) output at pins (88), (89)<<SP1>> and pins (86), (87)<<SP 2>> of IC201?
LP(PAL, SECAM)/EP(NTSC) mode: Is there record FM signal (approx. 20mVp-p) output at pins (93), (94) <<EP1>> and pins (92), (91)<<EP2>>of IC201?	LP(PAL, SECAM)/EP(NTSC) mode: Is there chroma ingredient included signal (approx. 20mVp-p) output at pins (93), (94)<<SP1>> and pins (92), (91)<<SP 2>> of IC201?

- NO → Is the supply voltage of 5V (PRE/REV Vcc) fed to pin (90) of IC201?
  - YES ↓
  - Replace IC201.
- YES ↓

Check or replace the cylinder.

Although picture record is possible, colour does not appear in PAL or NTSC mode (E-E mode is possible).

Is voltage of 5V applied to the chroma power terminal at pin (61) of IC201?
- NO → Check peripheral circuit pin (61) of IC201 and Y/C 5V line.
- YES ↓

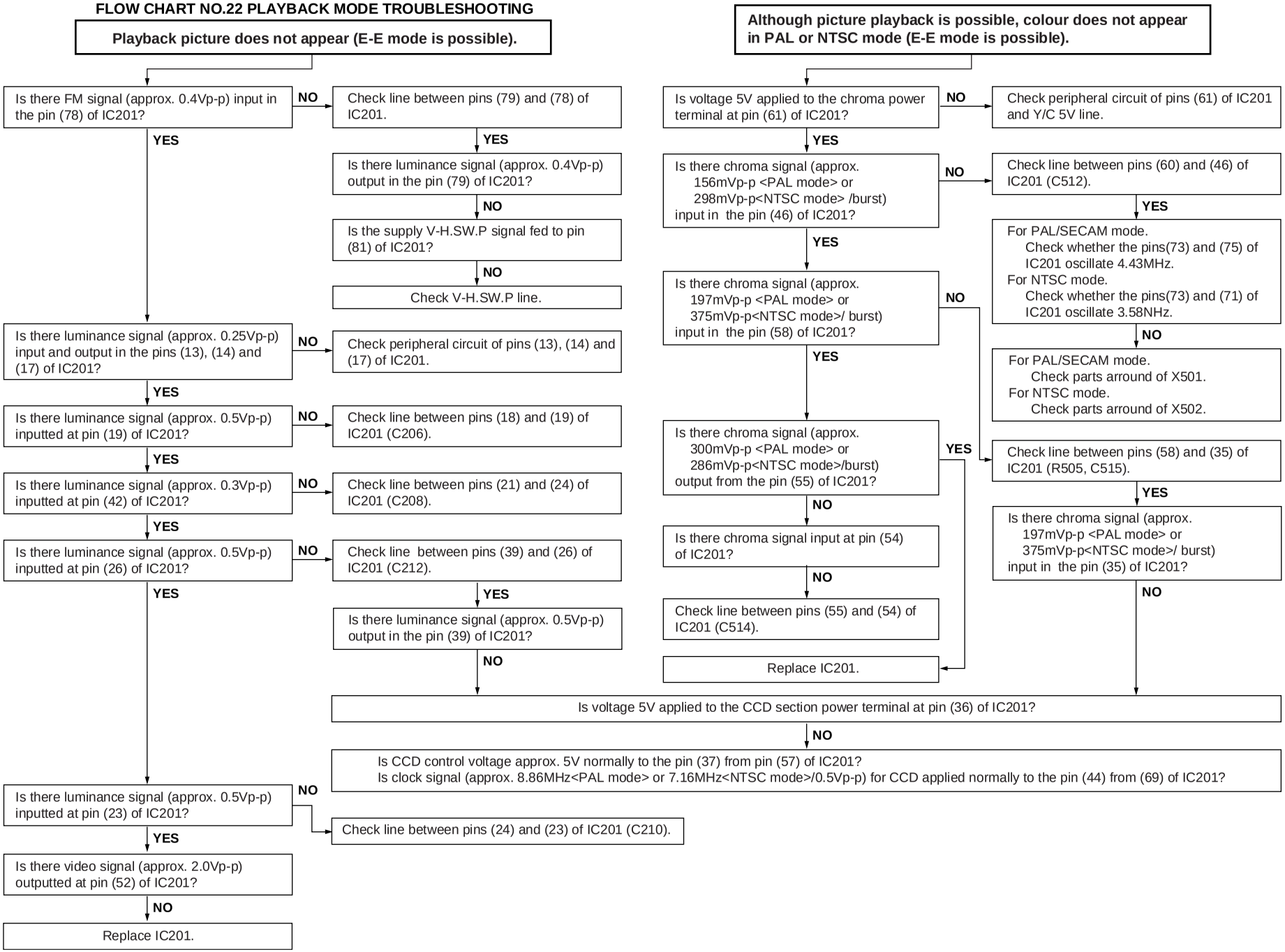
Is there chroma signal (approx. 156mVp-p <PAL mode> or 298mVp-p<NTSC mode>/burst) input in the pin (46) of IC201?
- NO → Check line between pins (60) and (46) of IC201 (C512).
- YES ↓

For PAL/SECAM mode. Check whether the pins(73) and (75) of IC201 oscillate 4.43MHz.
For NTSC mode. Check whether the pins(73) and (71) of IC201 oscillate 3.58NHz.
- NO ↓

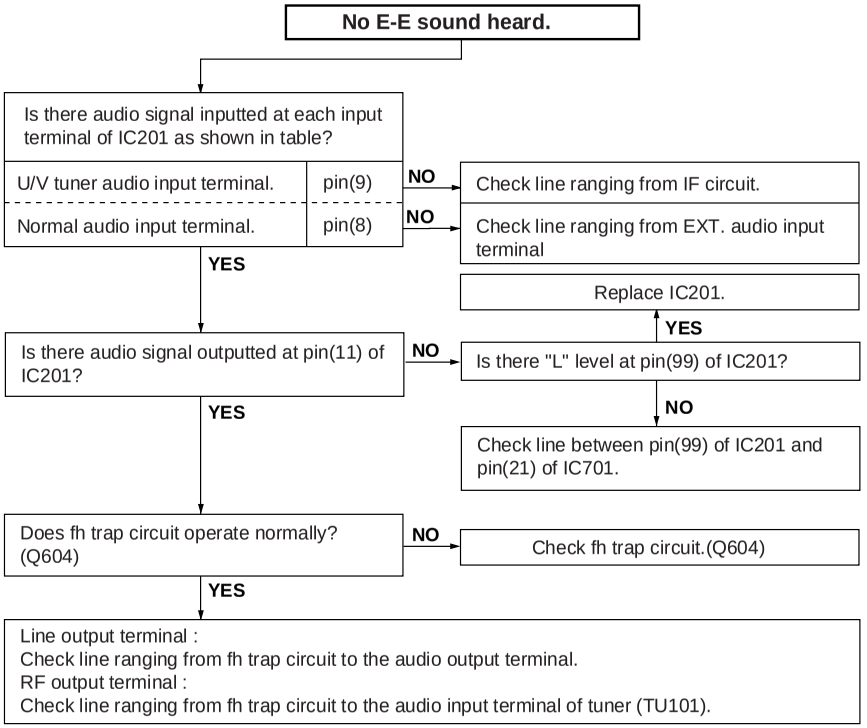
For PAL/SECAM mode. Check parts arround of X501.
For NTSC mode. Check parts arround of X502.
- YES ↓

Is there chroma signal (approx. 197mVp-p <PAL mode> or 375mVp-p<NTSC mode>/burst) input in the pin (35) of IC201?
- NO → Is there chroma signal (approx. 197mVp-p <PAL mode> or 375mVp-p<NTSC mode>/burst) input in the pin (58) of IC201?
  - NO → Check line between pins (58) and (35) of IC201 (R505, C515).
  - YES ↑
- YES ↓

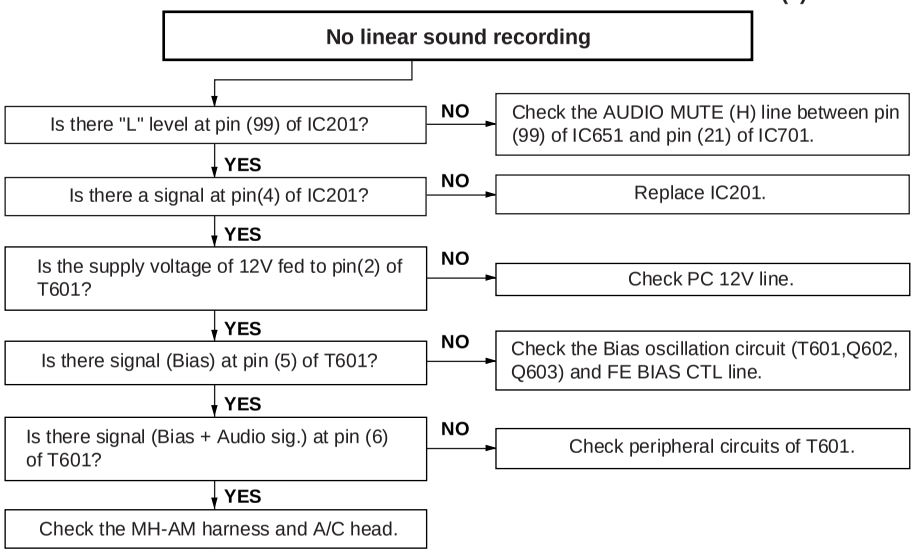
FLOW CHART NO.22 PLAYBACK MODE TROUBLESHOOTING



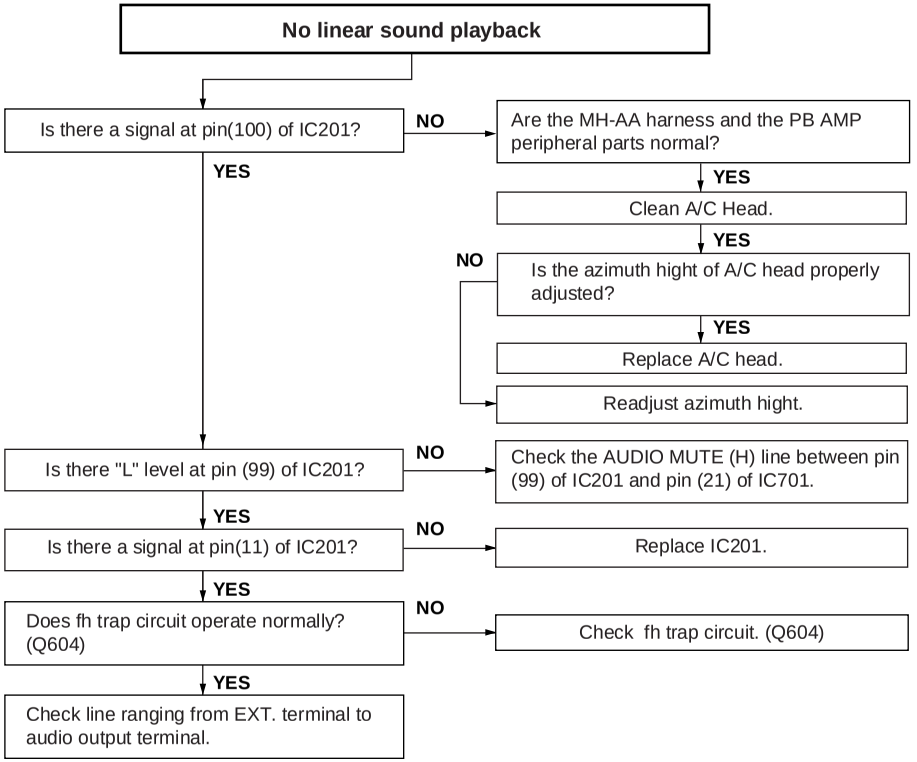
FLOW CHART NO.24 LINEAR SOUND MODE TROUBLESHOOTING(1)



FLOW CHART NO.25 LINEAR SOUND MODE TROUBLESHOOTING (1)



FLOW CHART NO.26 LINEAR SOUND MODE TROUBLESHOOTING (2)



REPLACEMENT OF IC710(E²PROM)

《Servicing precautions》

When the IC710(E²PROM) has been replaced, make the following reprogramming.
Depending on models, the IC710(E²PROM) has been factory adjusted for it's memory function.
It's therefor necessary to reprogram the memory function for the model in question.
Note that the servo circuit requires readjustments for the slow and still modes.

1. Memory function reprogramming.
   1. Check the power off.(Power is standby mode)
   2. Make for moment short-circuit test point (TP801), located at the front side on the main PWB."
      Be sure that all the fluorescent display tube light up into the TEST mode.
   3. Using the CHANNEL(+) AND (-) buttons, select the right function numbers from JP0ü`J39, which appear in the fluorescent display tube, referring to the E²PROM map.
      Press the DISPLAY button to pickup the functions (ON) and the CLEAR button to discard the functions(OFF).
      DISPLAY and CLEAR buttons, are located on the remote control unit.
      - ∗ when the DISPLAY button has been pressed (ON), the memory function number starts flashing.
      - ∗ when the CLEAR button has been pressed (OFF), the memory function number lights up.
   4. Press the FF button on the remote control unit.
      By doing, lower 5 of the 10 digits are displayed in hexadecimal notation.
      Example : "ON" and "OFF" are taken as "1" and "0" respectively.

JP19	JP18	JP17	JP16	JP15	JP14	JP13	JP12	JP11	JP10	JP9	JP8	JP7	JP6	JP5	JP4	JP3	JP2	JP1	JP0
0	1	1	0	0	1	1	0	0	0	1	0	0	0	0	1	0	0	1	1
	↓				↓				↓				↓				↓		
	6				6				2				1				3		

   5. Press the STOP button on the remote control unit.
      By doing, upper 5 in the 10 digits are displayed in hexadecimal notation from the feature function."
      Example : "ON" and "OFF" are taken as "1" and "0" respectively.

JP39	JP38	JP37	JP36	JP35	JP34	JP33	JP32	JP31	JP30	JP29	JP28	JP27	JP26	JP25	JP24	JP23	JP22	JP21	JP20
0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0
	↓				↓				↓				↓				↓		
	3				6				0				0				8		

2. Memory recording preset level reprogramming.
   1. Similarly to the above step 1-1 and 2 the same operate.
   2. Using the CHANNEL (+) AND (-) buttons, select the right function numbers continued from recording preset number as has been <LP p ∗ ∗ to SP p ∗ ∗>, which appear in the fluorescent display tube, referring to the E²PROM map.
   3. Recording level preset number selected from the ten keys on the remote control unit, which appear in the fluorescent display tube, referring to the E²PROM map.
   4. Example : SP or LP p ∗ ∗

      ↑ ↑ ↑ ↑

      Tape speed — Chrominance preset number. (from "0" to "7")
      Luminance preset number. (from "0" to "7")
      System (p : PAL)
   5. When press the REW button on the remote control unit.
      By doing, PAL system recording level preset number selected from the ten keys on the remote control unit which appear in the fluorescent display tube, referring to the E²PROM map.

LP p ∗ ∗	LP p ∗ ∗	SP p ∗ ∗	SP p ∗ ∗
↑	↑	↑	↑
selection from the ten keys. (from "0" to "7")	selection from the ten keys. (from "0" to "7")	selection from the ten keys. (from "0" to "7")	selection from the ten keys. (from "0" to "7")

   6. When press the PLAY button on the remote control unit.
      By doing, NTSC system recording level preset number selected from the ten keys on the remote control unit which appear in the fluorescent display tube, referring to the E²PROM map.

EP p ∗ ∗	EP p ∗ ∗	SP p ∗ ∗	SP p ∗ ∗
↑	↑	↑	↑
selection from the ten keys. (from "0" to "7")	selection from the ten keys. (from "0" to "7")	selection from the ten keys. (from "0" to "7")	selection from the ten keys. (from "0" to "7")

3. Finally make for a moment short-circuit test point (TP801), located at the front side on the main PWB to clear the TEST mode.

ROM MAP

	MODEL	VC-TA350/355	VC-TA351/351W/TA356	VC-TA352
EP n * *	NTSC Luminance level	3	0	4
EP n * *	NTSC Chrominance level	4	0	3
SP n * *	NTSC Luminance level	4	5	5
SP n * *	NTSC Chrominance level	4	4	3
LP p * *	PAL Luminance level	3	0	4
LP p * *	PAL Chrominance level	4	0	3
SP p * *	PAL Luminance level	4	5	4
SP p * *	PAL Chrominance level	4	4	4
JP39	A.DUB	0	0	0
JP38	NOT SLOW ATR	0	0	0
JP37	INSTANT REPLAY	0	0	0
JP36	NTPB	1	1	1
JP35	NTSC SKEW	0	0	0
JP34	HEAD2	1	1	1
JP33	HEAD1	0	1	1
JP32	HEAD0	1	0	0
JP31	GAMMA	0	0	0
JP30	L.P 5MIN.	0	0	0
JP29	POSI89	1	1	1
JP28	R/C CODE 1/2	0	0	0
JP27	DNR	0	0	0
JP26	POST CODE	0	0	0
JP25	SAT CTL	0	0	0
JP24	AV LINK	0	0	0
JP23	Hi-Fi	0	0	0
JP22	SORT/AUTO CLOCK	0	0	0
JP21	DECODER	0	0	0
JP20	DOLBY SURROUND	0	0	0
JP19	NICAM 1	0	0	0
JP18	NICAM 0	0	0	0
JP17	G-CODE 1	0	0	1
JP16	G-CODE 0	0	0	0
JP15	OEM	1	1	1
JP14	LP	0	1	1
JP13	FRONT AV	0	0	1
JP12	DUBLE SCART	0	0	0
JP11	NOT RF OUT	0	0	0
JP10	TUNER 2	1	1	1
JP 9	TUNER 1	1	1	1
JP 8	TUNER 0	0	0	0
JP 7	SYSTEM 1	1	1	1
JP 6	SYSTEM 0	0	0	0
JP 5	SAT CH VPS OFF	0	0	0
JP 4	LOW POWER	1	1	1
JP 3	SPATIALIZER	0	0	0
JP 2	VPS/PDC	0	0	0
JP 1	COLOR 1	0	0	0
JP 0	COLOR 0	0	0	0
DISPLAY IN HEXADECIMAL NOTATION	JP DISPLAY 1(FF)	15200	16200	16200
	JP DISPLAY 2(STOP)	08690	0C690	2E690
	Y/C CURRENT 1(REW)	0756	4344	4344
	Y/C CURRENT 2(PLAY)	0756	4356	4353

0:LIGHT UP 1:FLASHING